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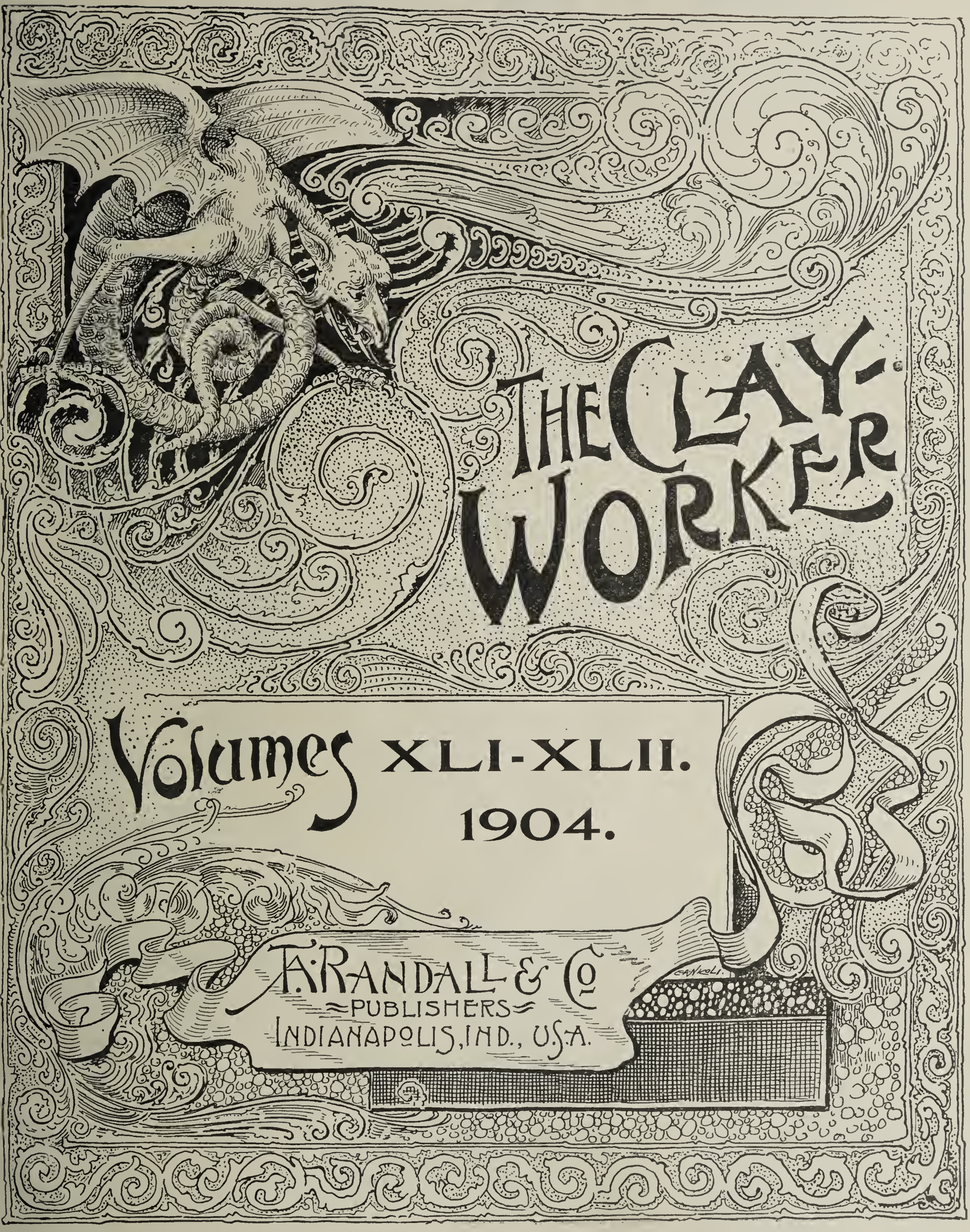

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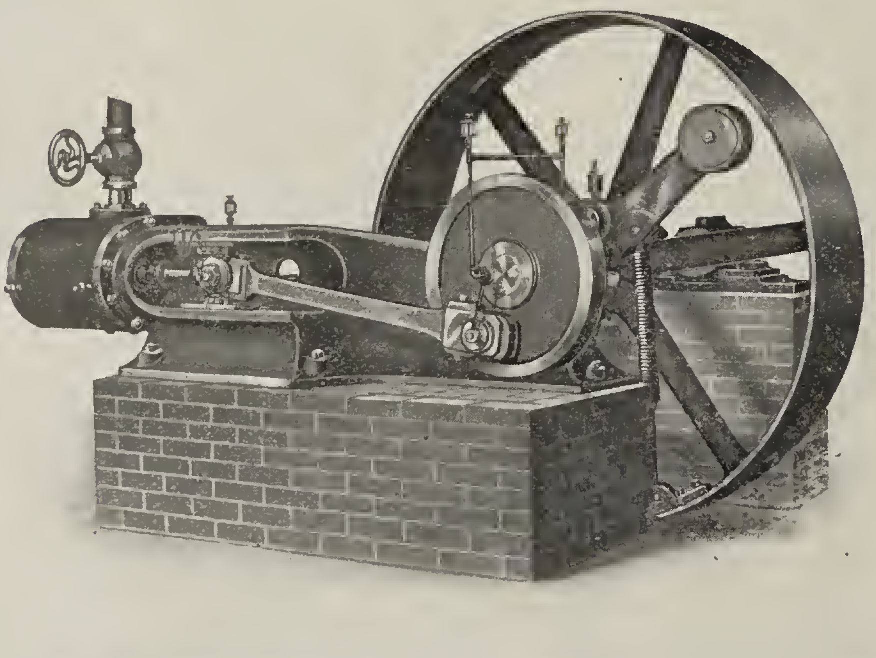

CHANDLER & TAYLOR CO.
INDIANAPOLIS, IND.

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IN AND ABOUT THE CONVENTION CITY.

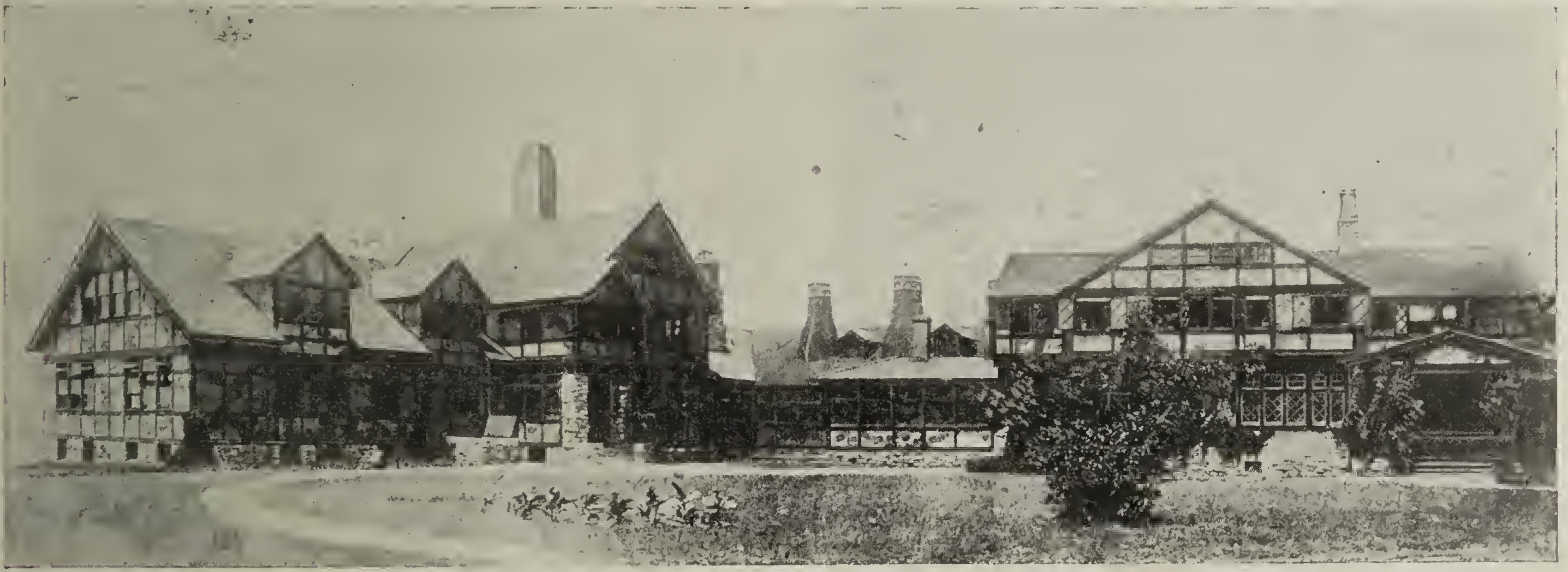
Rookwood, America's Foremost Art Pottery.—A Trip Through the Great Plant.

OHIO, RECOGNIZED as the home of many great men and not a few women of note, can also claim the distinction of having had materialize within her borders movements and enterprises which have become world-famed. Ohio is pre-eminently in the front ranks in regard to pottery. In Cincinnati is the home of the far-famed Rookwood Pottery, which was established by an Ohio woman, Mrs. Bellamy Storer.

On May 21 and 22 there was a fitting celebration at Chillicothe commemorating the one hundredth birthday anniversary of the State. On this occasion the program was made up of the foremost men of the country—past and present—governors, congressmen, supreme judges, representatives of the pulpit and press. Only one woman graced the program and it remained for her to pay a tribute to the Rookwood Pottery which will become history in the volumes which are being printed recording the proceedings of this memorable occasion.

The woman on the program was Mrs. James R. Hopley, of Bucyrus, formerly Elizabeth Sheppard, who had for her subject "The Part Taken by Women in the History and Development of Ohio," and after recounting the various achievements of the women of the State, Mrs. Hopley said with dramatic fervor, "But the most renowned of America's Art products is the Rookwood Pottery founded by an Ohio woman, Mrs. Bellamy Storer, wife of our present ambassador to Austria. No finer pottery is anywhere made. Fine in quality, beautiful in decorative value, its fame is world-wide. Mrs. Storer invented the peculiar glaze effect which marks its distinction from all other pottery in the world. It was she, who for years, did the actual work and to her wonderful taste, energy and spirit is due a product which is admired by all connoisseurs and which alone would have given America a place in the world of art."

Clayworking is a fascinating study as well as a remarkable industry as we see it in operation at the Rookwood Pottery. The closest inspection of visitors to this extensive plant will reveal the fact that in ceramic preparations, embracing bodies, designs, colors and artistic finish and effects, the knowledge possessed by those who are engaged in the work is wide and practical.

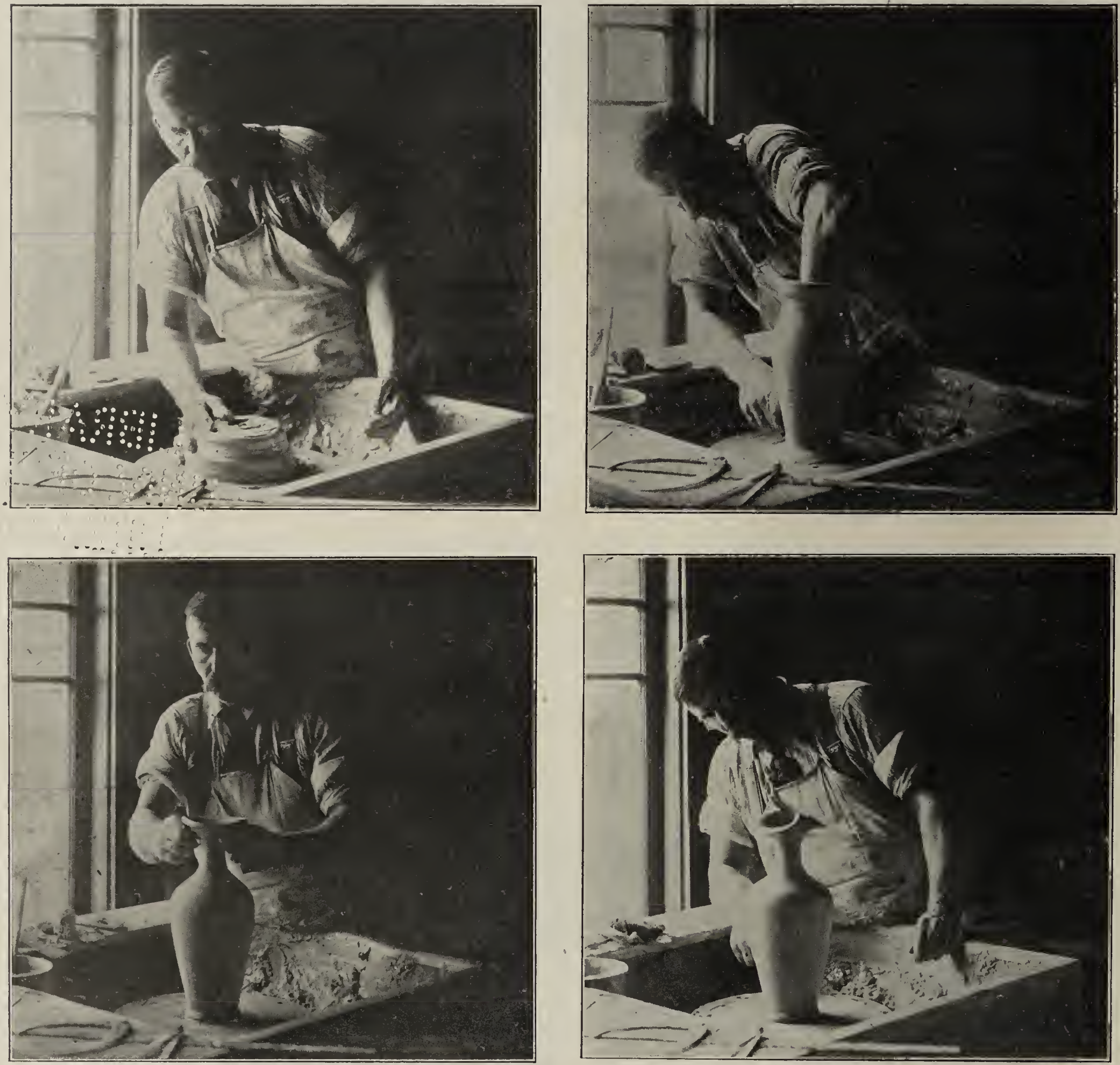


General View of the Rookwood Pottery, Cincinnati.

To revel in the beautiful ware in the Rookwood Pottery, where room after room is filled with beautiful pieces including vases, jardiniers, pitchers, chocolate pots, tea sets and other designs is a veritable dream of loveliness.

After almost a quarter of a century of successful work and almost phenomenal growth and progress it is found necessary for the Rookwood Pottery to once more follow the scriptural injunction to "build greater!" The president, Mr. W. W. Taylor, writes: "We are just putting up a large annex to accommodate our Architectural Faience Department, which is rapidly expanding and seems to have a great future before it. The addition will be similar in style to the present building and adjoins it on the north."

The picturesque and attractive location of the Rookwood Pottery is in keeping with the choice collection of world renowned wares which are found within the buildings which consist of a group after the early English style, with tile roof and timber construction, with cement panels.



The Four Stages in the "Throwing" of a Vase.

The pottery is visited every year by more than ten thousand people who are shown through by courteous attendants, who are pleased to explain the complicated processes of manufacture. In visiting the pottery the visitor is courteously permitted to see the preparation of the clay; watch the potter at his wheel deftly throwing the clay into all manner of artistic and beautiful forms; or examine the molds used in partial preparation of other pieces. Then the great kilns are inspected. The decorated ware, ready for firing, is seen in one apartment; in another is the biscuit after the first fire. Then come the tubs of glaze in which the biscuit is dipped. Finally, the finished work may be inspected in the ware rooms and one may study at leisure the many kinds of ware, the varied colors, the forms, decorations and glaze for which the Rookwood is so celebrated.

It would be difficult to determine just what, in 1874 or 1875, caused a number of women in Cincinnati, to experiment in the decoration of ceramics, and to state in just how far they may have been influenced by the Centennial Exposition in Philadelphia in 1876, which so profoundly stimulated art work in this country.

That the exhibits of France and Japan made a deep impression upon them, as upon other artists at that time, is evident. At any rate these Cincinnati women, who had there shown some work in over-glaze porcelain decoration, returned home with strengthened enthusiasm. They soon tried other processes of decoration under the glaze; went further, into the study of the body; tested all sorts of native clays, of which they found many excellent ones in Ohio and Indiana; and learned some of their possibilities.

Among these Cincinnati women who tried their hands at making pottery was Mrs. Maria Longworth Storer, who had the enthusiasm of the artistic temperament coupled with fixity of purpose and financial resources. Mrs. Storer had the courage to open a pottery which she called Rookwood, the name of her father's place on the hills beyond. This was in 1880, and on Thanksgiving day the first kiln was drawn.

Until 1892 the Pottery retained this location on Eastern Avenue, year by year modifying the old school building, and spreading out here and there until the possibilities of the site were quite outgrown. Then the piece of ground on the bluff at Mt. Adams, overlooking all of lower Cincinnati, was bought, and in 1892 the present picturesque building was completed as a permanent home, with every condition favorable to better and larger production.

In the meanwhile, in 1889, the works had become self-supporting, and Mrs. Storer then withdrew altogether. Thenceforth the pottery developed under many influences. The business was transferred to a company under the control of Mr. William Watts Taylor, who is still the head of the concern, and who had cooperated with Mrs. Storer since 1883. In 1899 a further important enlargement was made for additional studios and ware rooms.

The decorators comprise both men and women, and have been drawn, mainly, from the Art Academy of Cincinnati, an institution endowed largely by Joseph Longworth, the father of Mrs. Storer.

Not imitating other wares, Rookwood had to work out its own processes, developing its decorators and its own style. While these artists have year after year progressed in mastering this decorative medium, making their own technique, the attention of practical potters and chemists has been given to the preparation of clay for the body, to the study of glazes and the beautifying of form.

In the effort to attain a higher art, rather than cheaper processes, the Pottery is managed on lines opposite to the prevailing factory system. Mechanical repetition is avoided. Each piece is a fresh and independent rendering of its motive. Of course no printing patterns are ever used. A spirit of liberality has encouraged the decorators every way to cultivate individual artistic feeling. Thus, the Pottery sent all its workers to the World's Fair in 1893, has sent several to Europe for a summer and one to Japan.

A brief explanation of some of the most frequent terms applied to various branches of the potter's art may save confusion in the mind of the reader. Diverse usage and lack of precision on the part of writers on the subject have made its nomenclature somewhat difficult to understand. The following definitions are, for the most part, from a work on Ceramic Art by Jennie J. Young.

Expert "Turners" at Work in the Rookwood Pottery.

Pottery—Is from the Latin potum, a drinking vessel. It is applied in English usage to all opaque wares, as distinguished from translucent porcelain—also to the place of manufacture. The French word poterie, however, is a general name for all vessels, both earthenware and porcelain.

Faience—Is a French word, and is applied to every kind of glazed earthenware.

Porcelain—Signifies a vitreous or translucent ware. The name is derived from Porcella, a little hog; the first ware of this kind seen in Europe being the egg shell fabric of China, to which was given the name of pourcelain, its translucent delicacy suggesting the beautiful univalve shell familiar to dwellers all along the Mediterranean coast. The shell, in turn, is called porcella, from its fancied resemblance in shape to the back of a pig. Porcelain is of two kinds, the natural or *pate dure,* and the artificial, or *pate tendre.* The latter "soft paste" was the first to be discovered in Europe, by persistent chemical experiment.

Glaze and Enamel—Are terms often confounded. Properly applied, "glaze" means a transparent covering by fusing sand with an alkali. The addition of oxide of lead gives transparent plumbiferous glaze. When this is combined with oxide of tin, opaque stanniferous enamel is the result. Salt glaze, the only kind of glaze produced by fumes during baking, is also used on pottery. Another is a thin, plumbeous glaze called varnish.

Biscuit—Is a technical term aplied to all kinds of ware before they are enameled or glazed. It literally means twice baked, but is invariably used as a name for both pottery and porcelain when but once baked.

As to the varieties of Rookwood; the manner of Rookwood growth has necessarily given rise to considerable variety of types within the broad limits of character peculiar to this pottery. The experiments which continue to be made are adding constantly to these, as freshness and individuality are systematically striven for.

In the Kiln Room at Night.

The native clay from the start inclined the color quality towards yellows, browns and reds, and the decorative medium lent itself to a rather luxuriant style of ornament in rich arrangement of warm color, all of which the transparent glazes sought to merge in a deep yellow tone. As the command of material strengthened, the ware steadily gained in a beautiful harmony of all the elements which compose it, until form, color, decoration and glaze, combine to give Rookwood its enduring charm.

"Standard Rookwood" is the term given the type which first matured. It is the familiar low-toned ware, usually yellow, red and brown in color, with flower and figure decorations. It is characterized by a luxuriant painting in warm colors under a brilliant glaze. From a comparatively light and golden scheme the color arrangement varies to a deep, rich red, and brown, and green combinations in mellow tones. Closely related to these are the remarkable glaze effects, known as tiger eye and goldstone.

The tiger eye was first made at Rookwood in 1884 and is the earliest of the class of crystalline glazes since so extensively made at Sevres, Copenhagen and Berlin, though none have attained this particular effect. The next important distinction achieved by Rookwood in the way of peculiar effects was Sea Green, in which a limpid, opalescent sea green effect is attained. Beautiful combinations of rich, deep blues, and greens, relieved with glowing touches of golden yellow, red and other warm colors mark this variety.

The desire for gray tones led to the gradual development of the Iris, that class of Rookwood naturally evolved from the application of Rookwood methods to the creamy, white clay body, instead of the yellow or red. The methods of preparation are the same as in the standard ware with such modification as came naturally from the light body decorated with delicate grays, pinks, soft blues, greens, and yellows. The lighter color schemes, the more delicate body, and the white glaze over a decoration which is sometimes crisp and clear, sometimes deliciously tender and suggestive, lead to a more sensitive handling.

The Iris has a real pottery quality, a softness quite other than that of porcelain, a mellowness in fact which marks it as Rookwood, distinct from other makes of light ware.

Flowing Glaze is deep and heavy and has a quality in many respects resembling some of the old Chinese. It has a similar luminosity and at the same time a peculiar richness of texture. The decoration is painted upon the piece in slight relief, in forms and colors so simple that the glaze may flow pleasantly over them.

In 1896 Mat Glazes were developed at Rookwood as an outgrowth of earlier efforts at a dull finish or smear glaze in which an attempt was made to preserve the beauties of Rookwood biscuit. In the mat glaze now made the texture quality has, however, become the supreme consideration. The method is altogether different. Specimens of mat glaze were displayed at the recent Paris Exposition, where expert opinion ranked them among the highest of their class. As the fruit of long and intricate experiment, especially during the past two years, a far wider range of color and decorative effect has been brought under control.

Filling a Kiln with Rookwood Ware.

While differing radically from the old smear glaze in method, this latest variety of Rookwood is like it in the absence of a glossy surface. But as the applied decoration now becomes subordinate, the heavy enamel, or glaze, with which these pieces are invested is no longer designed merely to protect the colors beneath, nor to reveal them as though swimming in a lustrous depth.

The glaze is now itself the chief and highest interest. It demands of the forms upon which it is placed that simplicity of line, and almost rugged strength, which best supports the glaze mass and least distracts the eye from the subtleties of the glaze texture.

Out of the Rookwood mat has grown a demand for faience panels flat or in relief, in all the combinations in which the architect or the decorator delights to use the beautiful effects of color attainable in this glaze. The soft, waxen texture suits itself admirably to marble, woodwork and wall surfaces, overcoming completely the objectionable glitter in the ordinary mirror-like glazes.

Among the things of this kind made at Rookwood are complete mantels, mantel facings, wall panels, drinking fountains and architectural reliefs for interior decoration of public or private buildings. The pieces of faience are made in size and color to suit each particular purpose. The large sizes possible in Rookwood tiles permit the making of memorial tablets in one piece, the inscription and decoration being incised or modeled. The use of modeling combined with color under a mat glaze secures an endless variety of effects.

Rookwood is one of the most widely known of artistic ceramics. Its reputation extended from home gradually over this country, and in 1889 spread to Europe, where its exhibit at the Paris Exposition won for it immediate recognition. Foreign potters were attracted and foreign museums bought specimens for exhibition and study. The gold medal gained in Paris in 1889 was followed also in Paris in 1900 by the Grand Prix, the highest award over the many competitors from Europe, America, and the Orient. At the same time gold and silver medals were awarded to collaborators at Rookwood.

Originality as well as technical merit could alone win this distinguished position in the esteem of connossieurs and potters. Rookwood was distinctly new in the ceramic world; it had from the start an individuality that grew out of a combination of fresh impulses in pottery with sound processes of manufacture and decoration. Of the essentials of good pottery making it was conservative, but it went straight back to these simple essentials, avoiding all imitation of other wares.

From this fresh impulse and directness of method came the artistic charm that the lover of pottery finds in Rookwood, different from any elsewhere. Thus Rookwood has added to ceramic art something original and distinctive. Rookwood has an organic character which comes with a natural and consistent growth from these foundation principles, and its freedom from tendency to follow the established types of pottery. In this development by growth lies the key to its peculiar success. The character thus built absorbed and fused together into an organic whole the manv qualities which go to make a consistent and vital art pottery. A technically perfect, and a very interesting result may be got by a combination of qualities imitated from various wares, but there will be no artistic vitality without the presence somewhere of an underlying character to blend all together.

Thus imitation fails, always, no matter how close. Rookwood, on the contrary, has from the beginning met its own problems, using previous experience of other potters only where that naturally adapted itself to Rookwood growth.

The following honors received throughout the world will give some idea of the standard of excellence attained by Rookwood:

Exposition Universaile, Paris, 1889, gold medal.

World's Columbian Exposition, Chicago, 1893. Highest award. Also exhibited in Fine Arts Building by Invitation.

Exposition Universaile, Paris, 1900, Grand Prix. Highest award.

International Exhibition of Ceramics, St. Petersburg, Russia, 1901, Grand Prix. Highest award.

Pan American Exposition, Buffalo, 1901, gold medal. Highest award.

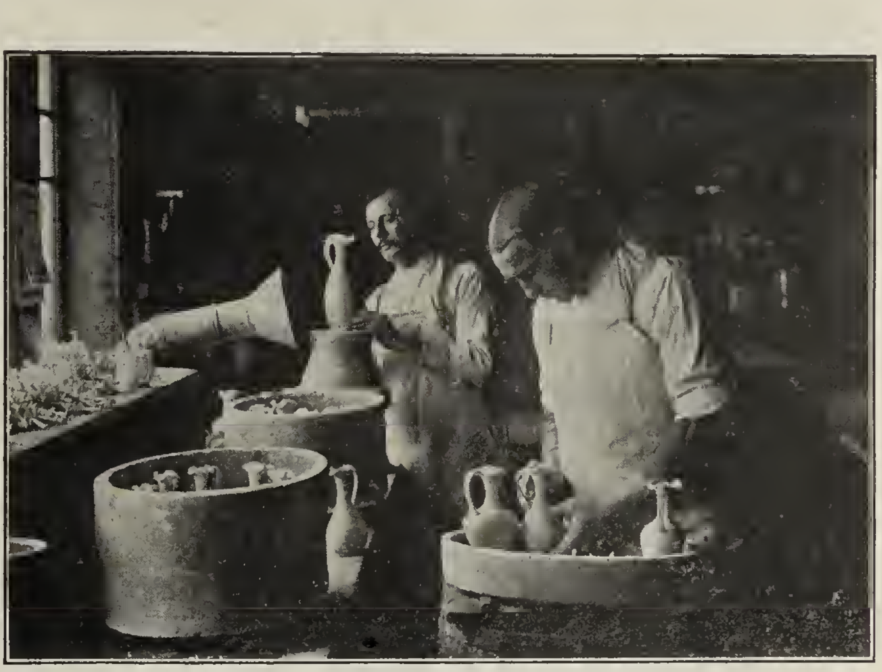
Charleston, South Carolina, Exposition, 1902, gold medal. Highest award.

Turin, Italy, International Exposition of Modern Decorative Art, 1902, diploma of honor. Highest award.

Among the museums for which Rookwood has been purchased as examples are the following: Sevres National Factory, Paris; Royal Industrial Art Museum of Wurtemburg, Stuttgart, Germany; Industrial Art Museum, Christiania, Norway; Industrial Art Museum, Breslau, Germany; Museum of Brunn, Austria; Museum of Prague, Bohemia; Imperial Commercial Museum of Tokyo, Japan; Pennsylvania Museum, Philadelphia; Museum of Cincinnati, Ohio; Museum of Hamburg, Germany; Museum of Decorative Arts, Harlem, Holland; Industrial Art Museum, Kaiserslautern, Bavaria; Museum Industrial Arts, Naples, Italy.

The fact that the genial though acquisitive treasurer of the American Ceramic Society, Mr. Stanley Burt, is the superintendent of the Rookwood works, will make a pilgrimage to the pottery a special delight to every member of that organization. It is a safe prophecy that every delegate to the coming National Convention will visit Rookwood sometime between February 1st and 13th, 1904.

"Casting" a Vase.



Placing the Green Ware in Saggers.

Sealing Top and Bottom of Saggers with Soft Clay.

Written for The Clay-Worker.

A VISIT TO THE CUMBERLAND, MD., SAND-LIME BRICK PLANT.

A Potomac River Enterprise Operated by Experienced Brickmakers.

THE INDUSTRIAL WORLD has been startled so many times by the announcement that a rival and substitute for the more than time honored clay brick had been found that the writer, when the sand-lime brick was heralded as the long sought for substitute a couple of years ago, immediately classed it as one of the sand bricks that had in the past shot, meteor like, across the building trades horizon, and dismissed it as one of the wild dreams of an enthusiastic inventor, that would soon follow in the footsteps of its predecessors. Nor did the carefully prepared paper on this subject presented at the Cleveland meeting of the American Ceramic Society at the time fully awaken me to the fact that the old story of "wolf" may be true at last. But, as water dropping on a stone will in time wear it away, the continual agitation on this subject by advertisements and articles on the subject in The Clay-Worker, and the second paper read at Boston, and the further fact that sand-lime brick factories were being established in widely separated parts of our country, aroused my interest in the matter and made me very anxious to visit an actually working sand-lime brick plant.

An opportunity to gratify my desire presented itself recently, by the establishment of a plant at Cumberland, Maryland, under the name of the Cumberland Granite Brick Co. (Huenneke's system). Hence I wended my way to that place, as soon as possible after learning of the plant being in operation, and found it to be a pleasant little city of about 20,000 inhabitants, nestled among the "hills of Maryland." Ordinarily, the works of this company are closed to visitors, but a letter to Mayor W. C. White from the American Granite Brick Co. headquarters, in Washington, D. C., the owner of the Huenneke system rights in nearly all of the southeastern part of the country from and including Eastern Pennsylvania, was the open sesame to the plant. Mr. White, the president of the company, is one of Cumberland's most progressive citizens, now serving his second term as mayor, being interested in the lumber business as the W. C. White Lumber Co., and other local enterprises, as well as president of the Queen City Brick and Tile Co., from which it would seem that he is in a position to quote figures to any one desiring to build in that locality, no matter what kind of material may be used, lumber, clay or sand-lime brick. Mayor White not only proved himself a courteous gentleman in extending the freedom of the sand-lime brick plant, but generously gave me the use of his fine pair of horses and driver to visit the Queen City plant, which I will refer to in another communication.

General View of the Works of the Granite Brick Co.'s Sand-Lime Brick Plant, Cumberland, Md.

The works of the company are located almost in the heart of the city on the Potomac River, which furnishes a plentiful supply of water for steam and other purposes, and is connected by a spur with the George's Creek and Cumberland Railroad. This line also acts as a belt road, giving the company connection with the Baltimore and Ohio and Pennsylvania Lines, thus affording ample shipping facilities for the product. The plant is under the immediate charge of Mr. J. C. Shaffer, who is also secretary of the company. He also holds a similar connection with the Queen City Brick and Tile Company and had charge of the plant of that company before the organization of the Granite Brick Co., and to him I am indebted for the facilities offered for inspecting the works.

The sand for the manufacture of brick at this plant is obtained in the form of a weathered sandstone from George's Creek, about five miles dsitant, and is delivered by rail. The lime is obtained from Washington County, Maryland, and is considered of fine quality. The stone is shoveled from the car to a nine-foot dry pan which grinds it to perhaps 40 mesh. It is then carried to an elevated screen by a belt conveyor, screened and passed to a bin, from which it is taken by gravity to an automatic measuring machine; all particles too large pass through the screen are carried back to the dry pan for re-grinding. I might state, in passing, that there seems absolutely no waste in the process at this plant. Any unused material, including defective brick after hardening, is simply passed back to some earlier stage to be used over again. The automatic measuring machine referred to in the foregoing measures the amount of sand—from 94 to 96 per cent.—and the amount of lime, from four to six per cent, all by weight of course, the lime being put in as received, and this mixture is passed on to a specially constructed tube mill, where the lime and the sand are ground quite fine and thoroughly intermixed and screened again, and again all rejected material is carried back for use later on. After passing through the mill and screen, the ground and intermingled sand and lime are passed to a special mixer, which looks for all the world like a good old pug mill, and it seemed like seeing an old friend to recognize one familiar implement used in common clay brickmaking, which was the one thing that reminded me up to this stage that I was in a brick plant, where it is tempered with water in the good old way, and passed by a belt conveyor to a bin which has a capacity of material for 70,000 brick, and is lowered by gravity to a conveyor belt, shown in the illustration, where more water is added, if necessary, by a sprinkler, and is elevated by another conveyor to the press, which is a four-mold Boyd press especially constructed for this work, with a maximum capacity of 23,000 brick per day of ten hours.

At the press, they are loaded on cars containing about 400 brick and carried to the hardening cylinders, of which this plant has one with a capacity of 20 cars. This cylinder is filled in a day's run of the machine, sealed and hardened over night by chemically charged steam at a pressure of 120 pounds to the square inch, and are ready for shipment the next morning, when taken from the cylinder, though the brick continue to harden after exposure to the atmosphere.

The arangement of the plant is most admirable, the raw material coming in at one corner of the plant and progressing steadily until the finished product is ready for shipment at the diagonal corner, no backward movement being made except of material which has been rejected, which is sent back for use again at some earlier stage in the process.

While the plant is new and an absence of bats was to have been expected, a careful examination of the system shows that, like the boy who was eating an apple, when asked by another chap for the core, replied, "There ain't going to be no core," so the sand-lime brickmaker will say, "There will be no bats or defective products," because at this plant at least the few imperfect brick they get are ground with the raw materials to be used over again.

The Boyd Press in Works of Granite Brick Co.

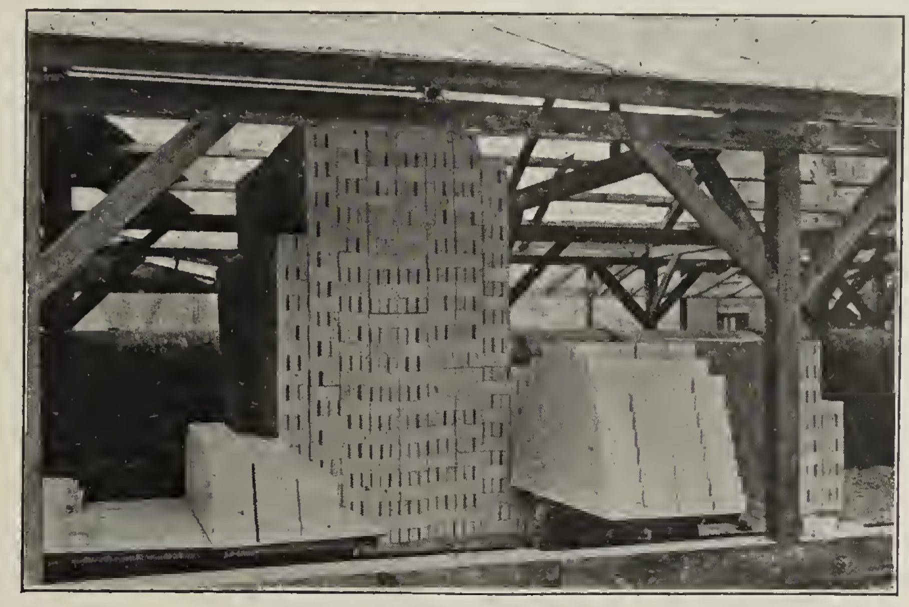
The plant is equipped with a Corliss engine of 125 horsepower, and boilers, which is sufficient to double the capacity when occasion demands it.

Mr. Shaffer, who, in addition to being actively in charge of the works, is also the secretary of the company and is an enthusiastic believer in the bright future of the sand-lime brick, and it was largely through his efforts the company was organized. So well does this company think of the process, that it has purchased the rights under the Huenneke system for the three western counties of Maryland, namely, Garrett, Allegheny, and Washington. In securing the rights in these counties, it seems to me that these men, who are clay-brick men as well, have displayed great business acumen, which should be followed by others engaged in the manufacture of structural clay products. If there is anything in this rival, and it seems to be the only rival of the clay brick worthy of the name, there is no reason why those whose business training has been along this line, should not engage in it.

As the illustration shows, my visit was somewhat inopportune as the plant, construction of which was begun in October, was not quite finished, and certainly not "looking pleasant" enough to have her picture taken.

The claims of the owners of this system that brick of almost any shade of color may be obtained are borne out by the fine specimens of colored brick displayed by this company at its plant. Young as this establishment is, it is preparing an exhibit for the World's Fair at St. Louis, which consists of fine examples of reds, browns, speckled or mottled and marblized brick, many effects which I have never seen in clay brick. While many of these may not be of commercial value, they serve to show what can be done in the way of coloring sand-lime brick. I hope the claybrick men are displaying the same energy in preparing exhibits for the great show at St. Louis.

In conclusion, I would say that a visit to this plant seems to verify the claims of the owners of this system for the manufacture of sand-lime brick, that the brick are of great uniformity of shape and color, that they can be made in winter as well as summer, and that it is possible to make brick in twenty-four hours. A system so simple in operation and so certain and satisfactory in results in such a short time must be a great success. It certainly is, technically, and the only question in my mind is whether the users of building brick will adopt it. I do not think for a moment that it will supersede the clay brick, but there are undoubtedly places where it will be made to greater advantage than the clay brick, and vice versa, but I think the sandlime brick has come to stay. It seems almost incredible, however, to one familiar with the manufacture of clay brick, that so handsome a product in an almost endless variety of shapes and colors could be produced in such a short time by such a simple process of manufacture.



Sand-Lime Brick Ready for Shipment. Hardening Cylinder in the Background.

At the time of my visit, early in December, they had made about 250,000 brick and had shipped over 200,000 to three jobs, one at Myersdale, Pa., and two at Frostbury, Md., which had given perfect satisfaction, but the cold weather coming on unusually early has interfered with the progress of the buildings, but not the process of manufacture.

J. M. AMANN.

"A penny saved is a penny earned." One way for clayworkers to save is to sell discarded machinery and appliances, instead of allowing them to rust and decay in fence corners. Either house and preserve such machinery, or sell it to some one who can make good use of it. There are many such who can be reached through the "For Sale" columns of THE CLAY-WORKER.

A BRICKYARD PILGRIMAGE.

One Way of Keeping Up with the Procession—How the Buckeye Brick Plants Look to a Sucker.

[SECOND PAPER.]

WE LEFT Indianapolis on the afternoon of the 18th and were due in Columbus at 9:30. As usual on this trip we were an hour late and were agreeably disappointed to find Prof. Orton and Ex-President Richardson at the Chittenden House, and were under obligations to them for valuable assistance in making up a program which would enable us to cover a certain amount of territory and reach Chicago Sunday morning. The time had slipped by so rapidly that some of our proposed visits must be omitted to accomplish this.

D. V. PURINGTON.

Greatly to our regret we found ourselves compelled to omit Canton. We did this simply because of its location, as to have gone there would have cut out several yards we had never visited. Thursday morning we spent at the University and the factory of Prof. Orton, with the Prof. and Mr. Richardson. The particular work shown us as the result of the Ceramic Class will be a part of the Professor's report to the Association and will be much more clearly explained by him than it could be by any one else. Mr. Richardson living in Columbus and being directly interested in many of these experiments, is without doubt adding constantly to that stock of information so necessary to his chosen avocation.

I sometimes think we ordinary everyday brickmakers have failed to fully appreciate what Prof. Orton has done for us. We are too apt to consider his work as too technical for practical usefulness—and to forget that the young men under his charge will be the practical clayworkers of the future. I know of nothing more clearly illustrating his position for thoroughness than his reply to W. S. who asked in regard to a proposition we had been discussing, "Don't you think Professor, etc.," His answer was, "Will, I don't think about such matters, *I prove them and then I know.'* This remark has come back to me many times since and I wish I could impress its importance upon the younger members of our profession. The old fellows who are rapidly becoming back numbers, and who have done so many things in a slipshod way without coming to any definite conclusions, and who in many cases have been unable to tell at the end of an experiment whether it was a failure or a success can appreciate to its full a method whose basis is thoroughness. Exactness as to quantities and quality of material, measurement of time and literal observance of fixed rules, with a correct tabulation of results, are among the things the ceramic boys are taught at Columbus. "They prove all things and hold fast to those which are good." I could not for Prof. Orton's sake recommend that all the clayworkers should take up as much of his time as we did, although I could do so for the sake of the clayworkers.

We visited one of the neatest little workshops superintended by Mr. Ross C. Purdy, where are made the Seger cones used by all the scientific burners of clay. We then visited a new brick yard, which had just been changed over from a sewer pipe factory, and were courteously shown over the plant. Then the Prof. insisted that we should go down town and lunch with him. We were taken to the Hartman House where we found Mr. Bleininger, Col. Kilbourne, and Charley Doan. I had forgotten to say that Mr. Richardson was compelled to leave us. I must force this letter along or it will not be finished in time for the January number. I can only say that this lunch was in every way in keeping with its donor. Materials, service, surroundings—all were modest, elegant, thoroughly practical, with just enough of the aesthetic to make a complete setting for so admirable a host.

Mr. Doan had volunteered as our chaperon for about thirty hours and our first stop was at Athens. As my rule is two meals a day and as I had felt on leaving Columbus that I should never need another, I embraced the time W. S. and Doan were eating supper at Athens to write a letter home—I speak of this because it was the only chance I had in the week. It is worthy of mention, too, that two such lean, cadaverous specimens of humanity as W. S. and Charley Doan could have found room for an additional meal after the one at the Hartman House. We spent the evening with Dr. Alderman, president of the Athens Co., and Mr. O'Blenners, one of the directors of the same company. There was much in this evening's talk to remind one of side shows at conventions. A good night's rest in the best room of one of the best hotels in Ohio, fitted us for a hard but delightful day. We spent the early forenoon at the plant of the Athens Co. Aside from this being one of the plants noted for first-class material there is nothing remarkable about it save that from the shale deposit to the track where brick are loaded on cars there is a gradual decline. While we all cannot locate our yards where such natural advantages exist, I think we can all appreciate their value. Just before noon we took the train for Nelsonville, accompanied by Messrs. Doan, O'Blenners and Alderman. The making of sewer pipe antedates that of paving brick and many of the best producing plants for brick were originally built for sewer pipe. This was true of the Nelsonville Sewer Pipe Co., which under the same name has for years been making pavers. The material at Athens is a pure shale, while at Nelsonville they use a bastard fire clay and salt-glaze all their pavers. It is not for me to discuss the propriety of doing this or whether such glazing improves the ware. As. Mr. Doan sells the product of both the Athens and Nelsonville companies and as there are strong advocates of both shale and fire-clay brick among the users it can easily be understood that he has an advantage over his competitor who has but one kind to sell. All he has to say with a first-class paver of both kinds is, "you pays your money and takes your choice." That he says it effectively is proven by the fact that neither of the yards had any stock of burnt material on hand.

We visited the new Nelsonville Paving Brick Co., and doubtless some of our readers can appreciate what it means to a company who has worked for years to build up a reputation to have a new company formed and located immediately adjoining them with a name very similar and really more appropriate. It is too bad, but there is no legal redress. I can write feelingly on this subject for I have been there. We bade good bye to O'Blenners and Dr. Alderman and with Doan reached Columbus as usual a little behind time. Rose at 5 a. m. next morning—our objective point being New Lexington, where our old friend Ellis Lovejoy presides over the manufacturing of plain common red brick made from shale by the stiff mud process, tempering with wet pans and using a Freese outfit, down-draft kilns, waste heat dryer, etc., etc. No yard I have ever visited makes a better common brick than those we saw here, and I have seen many where the dry process was in vogue, making face brick altogether that fell far short in quality of those shown us by Mr. Lovejoy. It only goes to prove that few of us do our very best and that experience, carefulness, knowledge are valuable auxiliaries to a good plant and first-class material. If you want to see beautiful, straight edged cherry red brick all well burned, I commend a trip to New Lexington, Ohio. Leaving this point an hour late, as usual, we wended our woy to Zanesville, where we were taken care of by T. B. Townsend and Mr. Burton, of the same company. We had both visited the old plant but were glad to do so again and also to see what is the nucleus of one of the largest and best equipped paving brick factories in Ohio. It will take time and money, but the boys have the first and T. B. the latter and all have lots of experience. From here we took the B. & O. for home, leaving Zanesville three hours later than the schedule and reaching Chicago just about the same time. I don't know why I should have inflicted this rambling letter upon your readers, and am sure that they will agree with me that there is truth in the old adage, "that it is better to give than to receive" —that is not just as it should be, but suits this case better than the original. With the exception of the gentleman who spent the day with us at Athens and Nelsonville I made no new acquaintances, but it is worth all the time and expense (there was little of this except car fares) to have made the acquaintance of gneial, bright, sunny Charley Doan, and it more than pays all it costs at any time to spend a few hours with Edward Orton, Jr. It is hard to particularize the benefits of our trip, but I think we were both satisfied that the investment was one the company found profitable. It certainly was enjoyable. D. V. P.

Written for THE CLAY-WORKER.

A GLIMPSE OF MEXICO.

The Native Pottery and Its Use.

OBSERVATIONS OF A CLAYWORKER, WHO FOUND HEALTH AND PLEASURE IN A BRIEF SOJOURN IN THE ITALY OF AMERICA.

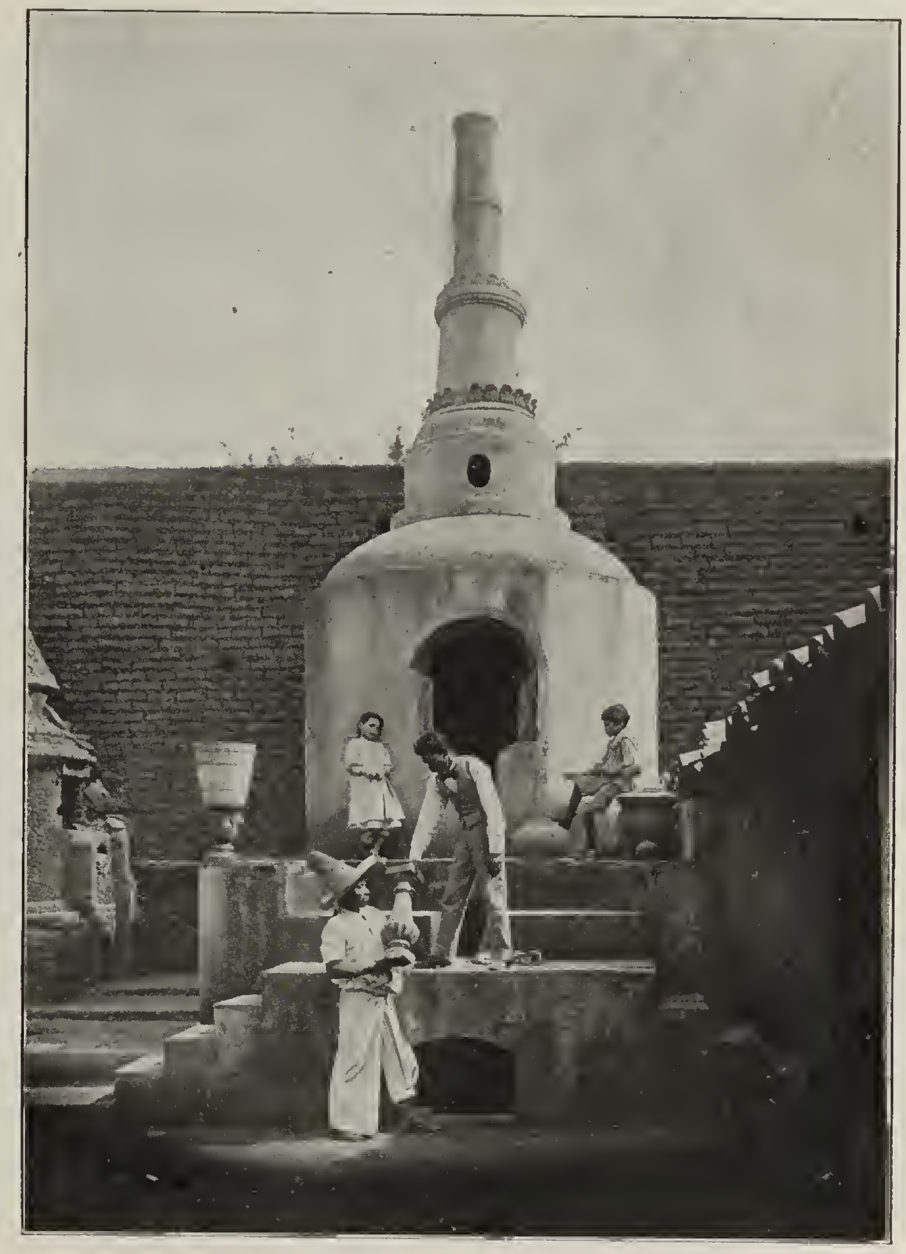
MEXICO IS a country that gladdens the heart of the clayworker, as all but the poorest buildings are of clay, the kitchen utensils consist almost exclusively of clay wares, while the "waterworks" of the great majority of the houses consists of the earthenware "olla." The two latter factors result from over seventy-five per cent of the 13,000,000 inhabitants still consisting of Indians, who are, with few exceptions, extremely poor. But their clay buildings vary greatly in character, from the one room "adobe" hut to the beautiful, picturesque manors of the better classes. The poorest of the Indians reside in a one-room hut that is made of open palings with a grass thatched roof in the timbered districts, or of rock walls in the barren country; but the greater portion of the Indians, and all the Spanish descendants, build their houses of "adobes" or sun dried bricks, and roof it with a very picturesque fan tile. These tile roofs are used exclusively in the villages and towns in the rain belt, though mud roofs are very plentiful in the more arid portions of Mexico, or in the central plateau district.

The roofing tile is hand made, of semi-conical type, and has a length of 21 inches, and tapers from about six and one-half to four and one-half inches in width. It is given a flash burn, and hence is so soft and porous that it leaks at first, until dirt and dust chokes up the pores. But it makes a very cool roof and, as laid in all shades of colors, it presents a vastly more picturesque, artistic roof than the severe monotone mechanical tile roof in this country.

The tile are laid on bamboo purlins, without any nails or fastenings, and are usually not plastered, as a generous lap is allowed. These fan tiles are also used for a coping course on the garden walls when these are made of adobes, as in the finer gardens. The tile are made to order, by contract, for the insignificent sum of $4.00 per one thousand (gold), and laid on the roof for $2.00 to $3.00 per square (gold); how could our American tilemakers compete with these figures, when they ask $4.00 to $12.00 per square at the factory, and the roofers double or quadruple these figures when laid on the roof?

The adobes are also made to order, at $4.00 per 1,000 (gold), and, as the size of an adobe brick is about three by twelve by eighteen inches, how would our American brickmakers like to compete with the Mexican Indian? Would it not rapidly change to "Lo, the poor American brickmaker?" Is it any wonder that American brickyards soon close down when they move to Mexico? With farm labor at ten to fifteen cents, common labor at twenty to twenty-five cents and skilled labor at twenty-two to thirty-five cents a day, and fuel and machinery usually very high, has American machinery much room for successful competition against the Mexican Indian, especially as skilled American labor demands $3 to $5 a day in Mexico? It is true the Mexican Indian is no such energetic worker as our American laborer, nor can much be expected from him when his living of beans and fortillas, or corn cakes, only costs about two to three cents (gold) a day, but he compares not unfavorably with our southern negro laborer, and is more tractable than the modern negro.

The clay for the tile is mixed with dried, pulverized horse dung, to avoid cracking and warping, while straw or grass is most liberally used in the adobes. The adobes are laid up in the wall with mud, after drying in the sun, and the entire wall is then plastered with mortar or stucco, in the better class of buildings, which entirely prevents their washing in the rainy season. The adobes are occasionally burned, especially in the cities, when they make a superior material, as they are then free from the dampness that is liable to make the raw adobes houses unhealthy in the wet season.



A Mexican Pottery, Photographed for THE CLAY-WORKER.

The Mexican buildings rarely exceed one story, on account of the danger from earthquakes, and, as they always have an inner court, they make beautiful, artistic homes when care and taste are used. So that the larger cities abound with architectural gems that are not only most pleasing to the eye, but are also well adapted for the requirements of their hot climate, a matter too frequently overlooked by our American architects.

While the towns and cities of Mexico are built in solid blocks fires seem to be unknown, with the houses and roofs of clay, so that churches and buildings are to be seen that are over two and three centuries old.

The Mexican cooking and eating utensils are usually earthenware, which are all hand made, and usually burned in small, open topped up-draught kilns. The enclosed photograph is one of the "swell" kilns of Mexico, as it is in Guadalajara, in the state of Jalisco, which has the reputation of being the pottery center, as it contains two potteries of some size. While they would be called small in America, they are so much larger than the country home pottery, where one man will make a few "olla" or water jugs a month, that they have quite a reputation. At these potteries, they both form and mold, and some of their shapes are excellent in outline, and effective in design. While most of the Mexican earthenware is not decorated, considerable effort has been made at the Guadalajara potteries to decorate their goods. Some of the decoration in clay slips is good and unique, though crude, but much of it is an atrocious imitation in old paint, with no effort at burning in the color.

The Mexican "olla" (pronounced "oya") or water vessel should be transplanted to this country, as it is a most effective vessel for drinking water. For it is a soft burned earthenware bottle or jug that is sufficiently porous to permit a slight supage of the water, which usually evaporates as fast as it sups through; this evaporation so lowers the temperature as to keep the water at a most palatable, cool temperature that is as healthy as it is refreshing, is entirely free from the dangers of our ice water, and as economical as it is safe and healthy.

H. A. WHEELER.

FROM WOOD TO CEMENT TIES.

The Lake Shore & Michigan Southern Railroad Company is experimenting with cement ties at Lenawee Junction, Mich. There is a sharp curve at this point of the system, which was selected as the best place for testing the endurance of the ties under hard usage. The tie is composed of cement strengthened throughout its length with "T" rail. The ties have been in service several months, and so far have shown no cracks or other defects.

Written for THE CLAY-WORKER.

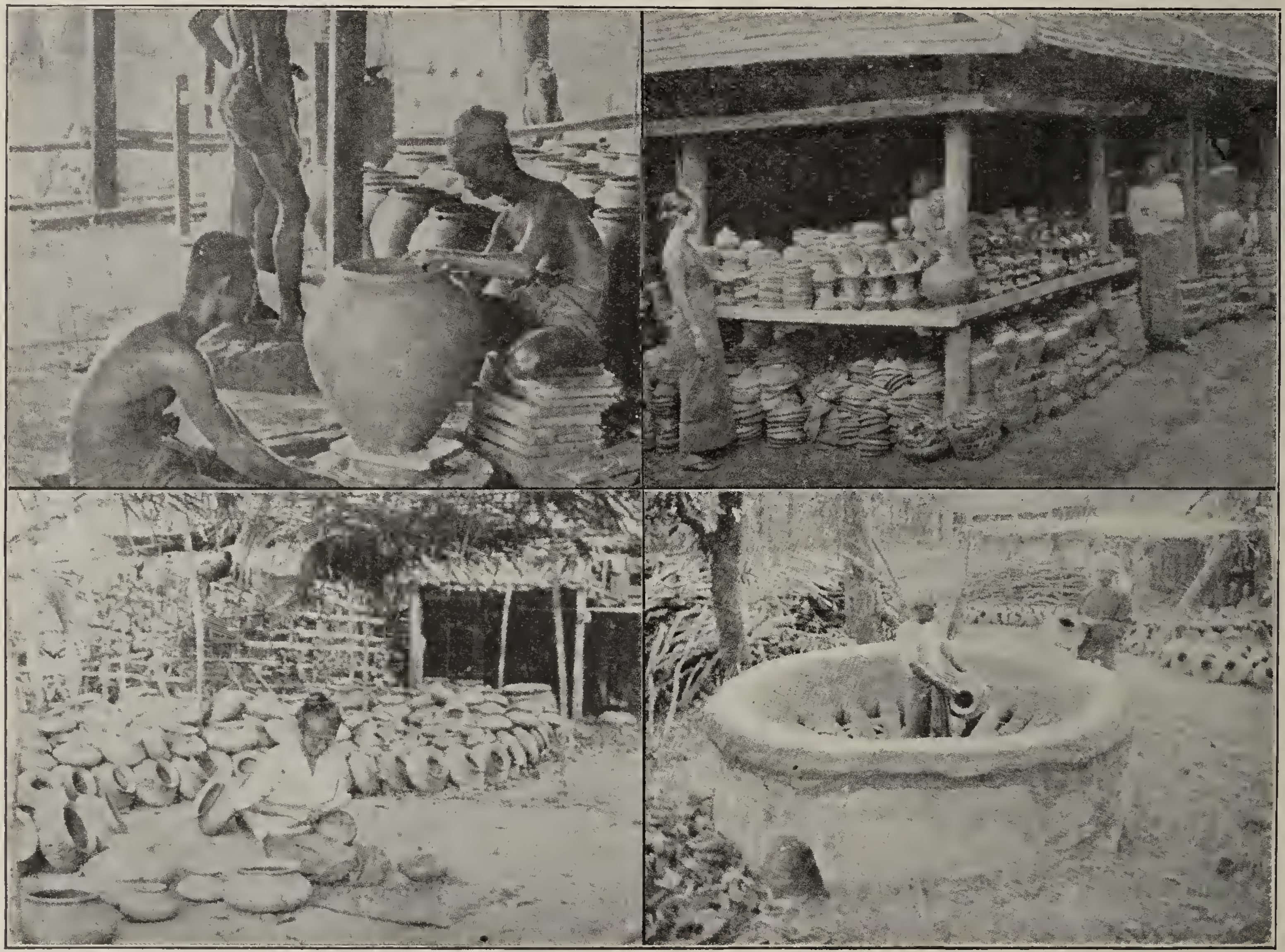
INDIA—THE NATIVE POTTERY BUSINESS.

The Indispensable "Ghurras" or Clay Water Vessels, Their Manufacture and Use.

BY GEORGE CECIL.

THOSE who have read their Omar Khayyam will cherish memories of the "suffi" alluded to by that poet. Present day visitors to India will find an earthenware vessel of the identical shape in use in almost every native house. Needless to say, they are cheap. Indeed, their cost is almost infinitesimal. However rude though they are, they fulfill their purpose admirably and are used by "Rajah" and "ryot" (peasant) alike.

But the humble little "pot" alluded to is not the only specimen of earthenware to be found in the oriental pottery circles, for large "ghurras," burnt to a deep Indian-red color, are to be seen in the bath room of every "Sahib" (master or gentleman). They contain his supply of cold water, are very fragile, being but about one-sixteenth of an inch thick. Often they break while the water is being poured into them or, upon being carelessly dumped down on the ground, the bottom gives way. Fortunately they are cheap, costing about three cents apiece. In shape they are not unlike a foot ball, being provided with a neck about two inches in height. The neck, it may be added, has no lip. It would be difficult to estimate the number of "ghurras" used in India every twelve months, probably several million are manufactured for the use of the better class and white people alone; while one is safe in saying that every single native, man, woman and child, buys a few during the year. It should be added that the "ghurrah" for native use is about eight inches high, the circumference being a trifle more. The Aryan stores milk or



Native Potters of India and Their Ware.—On the Right is seen a Workman "Filling" a Kiln.

water therein, sweetmeats, rice, and other staple articles of food and refreshment. Should his vessel become defiled by contact with a black man of a different "caste" to his own, he will destroy the "ghurrah." In the event of a pig (an unclean animal according to the native code of religious ethics) brushing it with his bristles in passing by, it will be unfit for further use. Should an English exile borrow it for drinking purposes it will be thrown away directly his back is turned. And all this is exceedingly good for the potter's trade.

There is practically no limit to the demand for these ubiquitous articles of Oriental pottery. The sporting subaltern requires them for his racing stable. They are to be found in the telegraph office—at the disposal of the native clerks, who frequently feel thirsty when engaged in dispatching urgent messages. Ladies have their bath water brought them in a "gurrah," and the whitewash and distemper which is periodically applied to the bungalow walls, is contained in a number of these most useful pots. The "hookah," for native use, is sometimes made of sun-baked clay. Such "hookahs," however, are used by the poorer classes only.

Extremely handsome china forms the bowl of the "hookah" since the indigenous inhabitants of India do not use the articles mentioned. They have a primitive habit of eating their food off large leaves (for dishes they have absolutely no use) and they wash their hands and faces by having water poured over them. "Rajahs" and other colored potentates are known to purchase bedroom crockery and of the most expensive procurable. But it is doubtful if they use it, they probably buy it for show, the educated native being at heart a regular jackdaw of Reims, consequently from time to time the rich Hindoos and Mahometans "indent" on the European shops at Calcutta, Bombay, for chastely ornamental basins and water jugs.

Though in the interesting ornamental pottery with which India abounds, most praiseworthy designs are to be found, the pottery ware referred to in this article is devoid of all attempts at bas-relief or any other description of molding. Horizontal lines are certainly produced by means of the application of a finger-nail or of a tightened piece of string when the clay is being formed. But this addition can hardly claim to rank as ornamentation.

It will possibly be of interest to give some account of the manner in which the "ghurras" and other pots are made. A weighty stone of circular shape rests on an axle, some two or three inches from the ground. A hole is made in it and a short stick, about four inches in length, is placed therein. The stone is thus easily set in motion. In the center of the stone reposes the mold which is covered with clay, the native's hand shaping it. Seated cross-legged, as is the custom of the country, he will work for hours, commencing his labors early in the morning, he will be at his post till mid-day. A couple of hours will be devoted to breakfast and a siesta, after which he will continue his pot making till dusk. His wares are baked by being placed in the sun, which with the exception of the rainy season, burns fiercely for ten hours every day. Thus during eight or nine months in the year a natural and free furnace is provided. It should be noted that not only in the large and important towns is the craft of pottery making extensively followed, but that in the smallest village a potter is to be found. Like his forefathers he is content to carry on the same trade. In many a hamlet an operative may be met with

Water Carriers of India Filling their Vessels from a Stream.

appertaining to a wealthy Hindoo. Small native lamps are also manufactured from clay. They are burnt to the universal deep red shade or are but slightly colored. The shape is almost similar to that used by the early Romans. Nor must the "serai" be forgotten. It is of earthenware and shaped somewhat like an ordinary decanter. With a view to keeping the heat out and enabling the water to become cool, the diameter of its walls is about half an inch thick. Every native takes with him a "serai" when on a railroad journey and many Europeans and Eurasians follow suit. The traveling accessory in question costs eight "annas" (15c). It should be pointed out that the price varies considerably. For though an Englishman will be expected to pay the sum mentioned, an unadulterated black man will be asked half this amount. The Eurasian also ranks as a native when it is a question of making a domestic purchase.

It is perhaps interesting to note that the Indian pottery industry does not include the manufacturing of dishes, plates, wash-hand basins and so forth. And the reason is not far to seek, whose ancestors for, perhaps five hundred years have manufactured pots. As a natural sequence his sons will become potters on attaining man's estate. In fact their religion demands it of them. There is, it may be added, no lack of clay in India. At Ranigounje, for instance, about nine different varieties are obtainable.

The range of goods emanating from the open-air workshop of the native potter is not extensive. In addition to the lines mentioned he sometimes turns out an occasional butter cooler, or a score or so of flower pots. It may be mentioned that the bungalow garden being a great institution in Hindustan, there is comparatively brisk demand for flower pots. They resemble the British variety.

It must in conclusion be added that the simple native of India does not need to invoke the aid of steam power. He is thoroughly content with his output, and even were he to contemplate increasing it, he would not find a market for the extra pots and pans. What he manufactures is sufficient for the demand, and he knows better than to saddle himself with a stock for which there is no immediate sale. He is contented, happy, sober and easily amused animal. He requires but little to eat; clothes do not trouble him particularly and his recreations are of a simple nature. He has no ambitions and but few likes or dislikes.

Types of Cheap Pottery.

FAKE ANTIQUES.

The craze for antiques and curios is responsible for some ingenious swindles but it is doubtful if many could surpass that which victimized an American lady traveling abroad, who, while in Holland purchased some alleged Dutch pottery, which proved on close examination to be common granite ware made in America in odd shapes and decorated in Dutch fashion to be sold in Holland as antique cooking utensils. American enterprise is frequently encountered in various ways in Europe, as for instance the experience of an American gentleman in London who bought a pair of rubber overshoes in a London shoe shop which were unusually satisfactory. On examining them, preparatory to buying another pair, he made the discovery that they were manufactured in Providence, R. I., by an American firm, although they were sold as English rubbers or "gums." The fact is well known that there is a considerable industry in the manufacture of so-called Egyptian scarabs in America which are sent to Egypt to be sold to unsuspecting tourists as genuine antiques.

Written for The Clay-Worker.

STATISTICS OF BRICKS.

TO COUNT the bricks made in this great country, with its more than three million square miles and its eighty millions of people, ready to help themselves to any convenient clay bank, seems like one of those mediæval tasks imposed by a wicked fairy on some spellbound victim, as the price of deliverance. To be sure, it takes time and money and patience even now—the co-operation of many producers, the skill of numerous statistical agents, the assistance of the locomotive, the mail bag, the telegrapph wire—but the task, gigantic and yet minute, is accomplished year after year, just as the enchanted princess in the fairy tale always succeeds in gathering all the four-leaf clovers in the world or enumerating the blades of grass in a meadow. That this is true is made known by the fact that the United States Geological Survey has ready for distribution a chart that shows the quantity and value of the clay products of the United States in 1902, as distributed throughout the several states. This chart was compiled by Mr. Jefferson Middleton under the supervision of Dr. David T. Day, chief of the Division of Mining and Mineral Resources.

The total value of our clay products in 1902 amounted to $122,169,531. Ohio is the banner state of the Union in point of production, leading off with $24,249,748 worth of goods. Pennsylvania, with a credit of $17,833,425, is next in line, and little New Jersey follows, with $12,613,263 to her name. Illinois comes next, with clay products to the value of $9,881,840, and New York follows closely with a value of $8,414,113. The last on the list is Wyoming, with a production valued at $22,150.

These clay products are of various kinds. They include common brick, front brick, vitrified paving brick, fancy or ornamental brick, and fire brick, as well as stove lining, drain tile, sewer pipe, ornamental terra cotta, fire proofing, tile, pottery and miscellaneous clay products.

A little over 40 per cent. of the total value of clay products is in common brick. The production of brick of that class in 1902 amounted to 8,475,067 thousand brick, having a value of $48,885,869. They brought an average price of $5.77 per thousand. Ohio, which stood first in value of clay products, yields to Pennsylvania, Illinois and New York in the value of its product of common brick. In point of quantity, New York, which produced 1,061,712 thousand common brick, takes precedence over all the others. A corresponding decrease in price is, therefore, shown New York brick averaging only $4.73 per thousand as against $5.01 in Illinois and $5.74 in Ohio, and $6.40 in Pennsylvania.

The quantity of front brick produced in the country amounted to 458,391 thousand, valued at $5,318,008, or $11.60 per thousand. Of vitrified brick, there were 617,192 thousand, valued at $5,744,530, or $9.31 per thousand. The value of fancy or ornamental brick amounted to $806,453, of fire brick to $11,970,511, of stove lining to $630,924, of drain tile to $3,506,787, of sewer pipe to $7,174,892, of ornamental terra cotta to $3,526,906, of fire proofing to $3,175,593, and of tile to $3,622,863. The value of miscellaneous clay products amounted to $3,678,742. These included adobes, aquarium ornaments, boiler and locomotive brick and tile, burnt-clay ballast, carboy stoppers, chemical brick and tile, chimney blocks, pipe and tops, clay furnaces, retorts and settings, conduits for underground wires, crucibles, curbing block, fire-clay insulators, fire mortar, flue lining, furnace brick and tile, gas logs, glass-house supplies, grave markers, ground fire brick, muffles, oven tile, paving block, porous cups, saggers, wall coping, web-tile, and well brick.

Nearly 20 per cent. of the clay products of the country are included under the term pottery. The value of the total product amounts to $24,127,453, of which Ohio contributed $10,519,138, thus showing that Ohio owes its rank as first of the clay producing states to its production of pottery rather than of brick and tile. New Jersey's pottery valued at $6,192,959 comes second on the list. Pennsylvania pottery amounted to the sum of $1,876,265, West Virginia to $1,166,464, and New York to $929,431. The pottery production of nearly every other state was below half a million dollars in value.

Enameled brick, the entire product of which was valued at $471,163, was made only in California, Illinois, Maryland, Missouri, New Jersey, Ohio and Pennsylvania. New Jersey and Pennsylvania, with products respectively of $202,740 and $57,183, were the only states in which there were three or more producers of enameled brick.

It is gratifying to note that the clay industries of the country appear to be progressing steadily. The year 1900 showed an output valued at $96,212,345, which increased in 1901 to $110,211,587, and has reached in 1902 the sum of $122,160,531. The chart which shows the figures for 1902 may be obtained on application to the Director of the United States Geological Survey, Washington, D. C.

As a rule, cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted," "For Sale," etc., columns a means of satisfying their needs.

Written for The Clay-Worker.

CINCINNATI'S POINTS OF INTEREST.

Historical and Modern Features of the Buckeye Metropolis Which Members of the N. B. M. A. May Visit Convention Week, February 1 to 6.

THERE ARE MANY points of interest about Cincinnati to visit not enumerated in my last letter. There is the Tyler-Davidson fountain erected in the public square by Henry Probasco, at a cost considerably over one hundred thousand dollars. Then there is the site of old Fort Washington on Third street and Lawrence, one corner of which is marked by a monument near that point, and but a very short distance from the business center of the city. The first permanent settlement of Cincinnati dates from December 26th, 1788. By May, 1789, there were eleven families, and twenty-four unmarried men in the settlement. An important event to the new community was the arrival about the first of June, 1789, of Major Doty with 140 regulars under orders to build Fort Washington at this place. The site chosen was on what is now Third street, between Lawrence and Broadway. The fort was built of hewn logs. In January, 1790, General Arthur St. Clair, governor of the Northwest Territory, arrived in Cincinnati and organized Hamilton county. Such was the beginning of our city and it has steadily grown in population and

A Section of Cincinnati's Sky Line, The Rookwood Pottery near the Top of the Incline.

trade ever since. At one time it was the largest pork packing city in the country and received the name of "Porkopolis." At the beginning of the last century, Cincinnati had 750 inhabitants and Chicago at that time had neither inhabitant nor name.

Cincinnati has always been a literary and artistic center. Its College of Music, situated in Music Hall, and many adjacent buildings, will repay the visitor. Also its superb Art Museum situated in Eden Park. The Art Museum has a collection of paintings that will rank with the best collections in the East. Visitors to the Rookwood pottery can take the Eden Park cars, get off at Rookwood, and then resume cars to the Art Museum, only a few squares further, and, at the same time, obtain a beautiful view of the city and river, and also Eden Park. J. H. Schmidlapp has lately donated funds for a handsome Ionic building to be erected as an addition to the Art Museum, and to contain some of its masterpieces The Carey sisters lived near Cincinnati in College Hill, one of its suburbs. General W. H. Lytle, author of "I Am Dying Egypt, Dying," also lived here, as well as W. W. Fosdick, the poet and author of the "Diamond Isle," and W. H. Beard, the artist, the great animal painter. Those who walk up Walnut street to Eighth, just after they have turned the corner, will see a three story brick house, and under the third story window is a bronze tablet indicating that in that room was written "Sheridan's Ride," by the author, Thomas Buchanan Reed. Mr. Reed wrote many other notable poems and was also a fine artist. He is especially dear to all brickmakers, for he has written the first notable and most pretentious poem to the brickmakers, the last verse of which I quote:

"Let the blinded horse go round,
Till the yellow clay is ground,
And no weary arms be folded,
Till the mass to brick be moulded—
Till the heavy walls be risen,
And the fire is in his prison,
Capitol and church and jail;
Like our kiln, at last shall fail,
Every shape of earth shall fade;
But the heavenly temple made,
For the sorely tried and pure,
With its builder shall endure."

The poem is too long to quote entire, as it contains some thirty stanzas, but is the finest tribute to our calling ever written.

Main Entrance to Cincinnati's Art Museum.

The poet also wrote the lines:

"He who builds a noble temple unto art,
And builds it solely from his head and heart,
Hath done a sacred service, our city hath need of him."

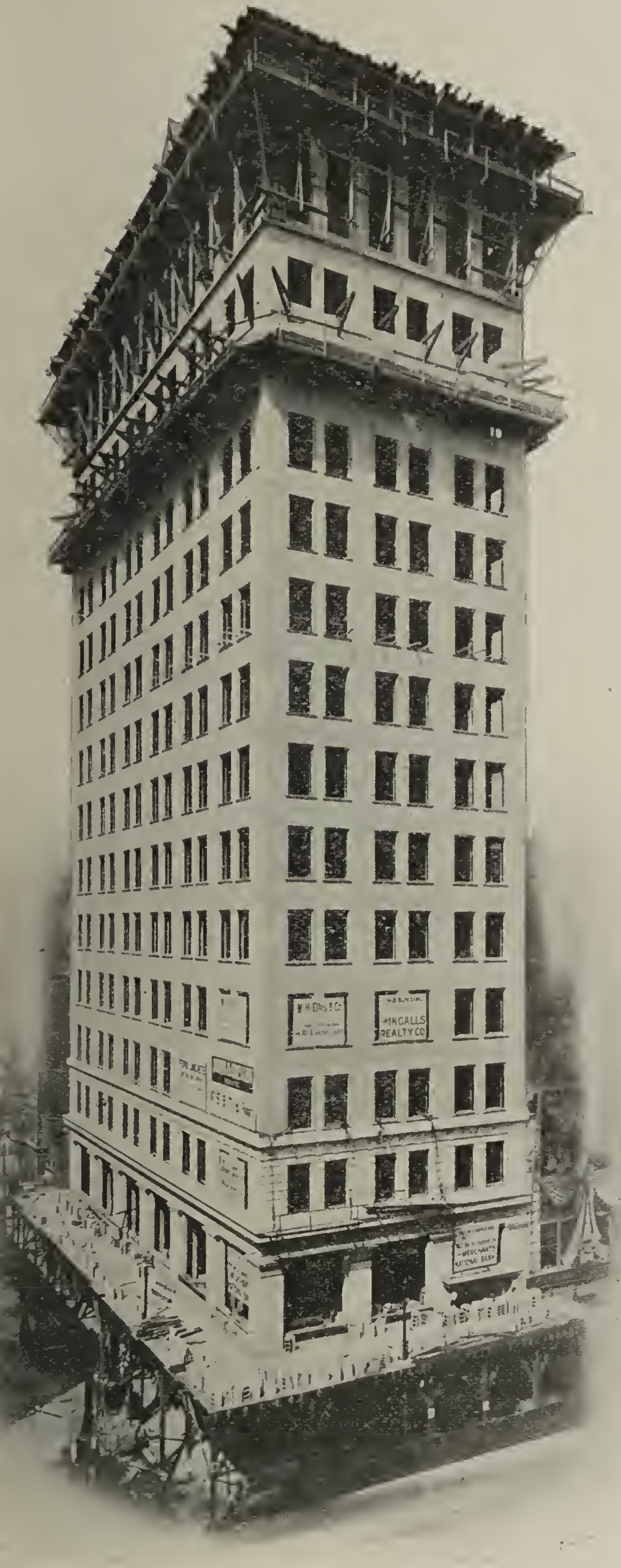
* * * * * * * *

"Go on, Great Mason, let thy trowels ring,
Announcing where still other temples rise."

On Pike street may be seen the former residence of Nicholas Longworth, who was the patron of art. Mr. Longworth's residence is now occupied by the Hon. Chas. P. Toft, the owner of the daily Times-Star.

Mr. Longworth was the first here to cultivate the grape and his catawba, and his sparkling wine, a generation ago, had a worldwide reputation and, on sending of a basket of it to the poet, Longfellow, inspired the poem, "Catawba Wine," and in which are the following stanzas:

"For richest and best
Is the wine of the West,
That grows by the beautiful river,
Whose sweet perfume
Fills the room
With a benison on the giver."



The Ingalls Block, Cincinnati.

"This song of the wine,
This greeting of mine,
The winds and the birds shall deliver,
To the Queen of the West,
In her garlands dressed,
On the banks of the beautiful river."

We hope that the guests of the Queen City will not fail to see our new city buildings and look at the stained glass windows with the latter portion of the above poem as the motto to the design.

Cincinnati is an up-to-date city, as the brickmakers who gather within her gates the first week in February to attend the N. B. M. A. Convention, will see at a glance. She has made wonderful progress during the last few years, and if she keeps up her present gait it will not be long ere she rivals Chicago in the number and height of her skyscrapers. Five great commercial structures of this sort, ranging from fifteen to twenty stories, were built within the past year. One of them, the Ingalls block, is of special interest, having been built of concrete strengthened with steel cables. Another similar building is now in course of construction, so that those who are interested can see for themselves the character of the work. In appearance, the Ingalls block is a brick structure, and a beautiful one, too, being faced with enameled brick from the kilns of the Tiffany Enameled Brick Co., Momence, Ill., with decorative features in enameled terra cotta. All of these skyscrapers are within a block or two of Fountain Square, and so will be seen and visited by all who attend the National Convention. They are all modern, fire-proof buildings, so-called, but the writer doubts if they are any more fire-proof than the Grand Hotel, which was built of brick furnished by J. M. Blair, father of the Blair Brothers, who have since continued in the business started by him. All of the party, or partition, walls are of brick, 5,000,000 being required. Those who stop at the Grand may give themselves up to peaceful slumber without a thought of the fire fiend, for the building is a type of the best of the old-style, substantial brick architecture.

B. W. Blair, a Charter Member of the N. B. M. A.

But I am making this communication too long, but hope that none who can will fail to visit us at the next meeting of the N. B. M. A. and partake of the good things spread before us by the Executive Committee of that organization. Let us meet once again at the cradle of our birth and exchange experiences during our journey of eighteen years, and renew our fealty to one of the noblest and oldest of all arts.

January 1, 1904. B. W. Blair.

If you are looking for cheap machinery, scan The Clay-Worker's "For Sale" ads.

Written for The Clay-Worker.

HUB OF THE UNIVERSE.

Boston Brickmakers Face the New Year With Satisfaction.

I DON'T KNOW how the term hub was first applied to Boston, and I don't care. Neither do I care who applied it, nor why nor when. I know the name fits and it's none of the humorous epileptic brand at that. Boston is the great cosmopolitan market for brains and the fruits thereof, and to prove it I invite you to meet some of her brick manufacturers and learn a little how things are done there. Traveling south from the orange groves and sweltering sands of New Brunswick, one meets with a number of centers—places whose inhabitants claim the call on everything in brains and brick, and each can show figures to prove that it is the one spot that furnishes brick to the world—and one carries the native opinion with him cheerfully as he passes down the hot December sands of Maine and along the palm-shaded villages of Vermont, through the banana lands of New Hampshire and the redolent nutmeg forests of Connecticut, aye, and down through the spice-laden breezes of Rhode Island, and

> "As he goes his wonder grows
> As each more marvels doth disclose."

Until he reaches Boston. Then he comes down to earth and learns the cause, for he finds himself in the central power station of the whole thing,

> "For seeking Boston day by day,
> He learns 'twas Boston all the way."

But speaking now of those engaged in the central Boston, I will say that since the settlement of the bricklayer's union strike, which began in July and lasted into August, conditions couldn't well have been better; and the manufacturers may well consider the strike not the least of the good things of the year, for the result seems to have settled forever the supremacy of the bricklayers' union in dictating terms to employers.

The principles involved in this strike were: first, an increase of wages, and second, that union men should have the right of way, which meant, more than ordinary preference, viz.: that when union men could be found anywhere between Greenland's Icy Mountains and India's Burning Plain, they should be sent for. As to who should pay the freight doth not appear, but the writer moderately presumes that the union's modesty, so far as it showed itself, had fixed upon the party to make good.

Early in the spring the union gave out warning of its intention to display its modesty on July 1st, with the usual result that the rush to build was conspicuous by its absence up to and including that date.

Hitherto the unions and the Master Builder's Association had had a working agreement which granted certain privileges to the unions, one of which was official recognition. The unions were not satisfied. After about two months the strike was declared off by the bricklayers receiving more pay individually and the unions receiving no recognition henceforth from the builders.

Notwithstanding the strike, prices of brick up to July held firm. During the progress of the fight prices of brick and lumber fell off, but at the happy termination of the contest business moved rapidly and prices followed suit. Prices for common building brick fell from the $8.50 to $9 level to $8 and less, but returned to the old rates after the strike. Today, at the close of the season, prices are naturally, irregular. Summing it all up the chief drawbacks of the season were: first, wet weather in June and July; and secondly, the strike, which was a wind with a breath of comfort in it. The troubles with brickyard help were not more than in ordinary years, but wages ranged from four to eight dollars a month more.

The greatest output by one concern was probably the New England Brick Company's of one hundred and odd millions. Fiske's plant at Portsmouth got out about 60,000 each day and was still pumping along at the same rate when my train flew past.

The Parry's turned out about thirty millions. As to the Dover River, New Hampshire, yards, many or most of which are controlled by Boston men, the output aggregated some twenty millions.

The demand for Harvard brick shows a steady increase. The territory lying between Portland, Me., and Rochester, N. H., is the natural home of the Harvard brick, you should know. It is indigenous to the soil, like the hickory and the tulip and the pumpkin are to other soils. It is the nature of the clay to produce them as it was the nature of Paddy's "baste" to eat his new Sunday-go-to-meeting shirt off the line. Other localities have tried to produce the Harvard brick but with doubtful success.

Some say it is the peculiar proportions of iron and other minerals contained in it. But, however, that may be the chief factors in the making of them are the old-fashioned methods of molding and burning; and if you are a sentimentalist like myself, who sighs for the days gone by and who takes a sight at an old water-struck brickyard as one would at the photographs of one's dearest dead, you should traverse the ridge of land in the Dover River, N. H., district where, side by side twenty-five at least in a double row, some very close together, the little plants sit in the summer time and the sweep-horse goes his round, the striker humps himself, and the old Dutch clamp sends up its dusky volumes of perfumes that put the perfumes of Araby decidedly to the bad, for blest though be Araby to her descendants, a million sweeter blessings flow up from the hand yards of New Hampshire, the heart of the home of the Harvard brick.

The history of the Harvard brick is interesting. Perhaps you've heard the story. However, it won't harm you to hear it now.

In 1884 Harvard University built a gate. It was decided to build it of brick. Now as every sort of use known in the accumulated knowledge of the earth had been furnished by brick, except the construction of a gate, this decision of Harvard College drew world-wide attention to the daring venture, for some of us reasoned thus: If Harvard scientists and masons may construct a gate of brick that can swing without getting a brick punched out of it some of us fellows in the pasture lots where fence rails are scarce and mud is plenty, may devise a set of pasture bars of brick. However, 'twas only a *gateway* they built, so we are not now looking for the brick fence rail. But they sent down to Parry's yard for old fashioned water-struck brick of great price and they laid them black arch-ends out, alternating with the beautiful terra cotta or deep red of the brick from the heart of the kiln. The effect was entrancing and thenceforth everybody ceased dreaming of brick-lined cornfields to dream of mansions a la Harvard. This year Harvard palaces went up throughout every section of the United States, notably New York, Trenton, Pittsburg, Washington, Philadelphia, Chicago, Cleveland and Cincinnati; and Boston supplies them all. Some of the buildings into which they have gone and are going are Eiblitz & Son's great structure on Murray Hill, New York City, where the big subway station is to be. The subway station itself will take half a million Harvards into its construction; Brooklyn's Carnegie's library will be of Harvards, and several other libraries throughout New York have been built of them. The private residence of Charles M. Schwab, and several of the residences of the Morgan syndicate in that vicinity and New Jersey will smile with sweet Harvard simplicity and purity on the giddy, gaudy, awkward and unabashed fronts of their neighbors.

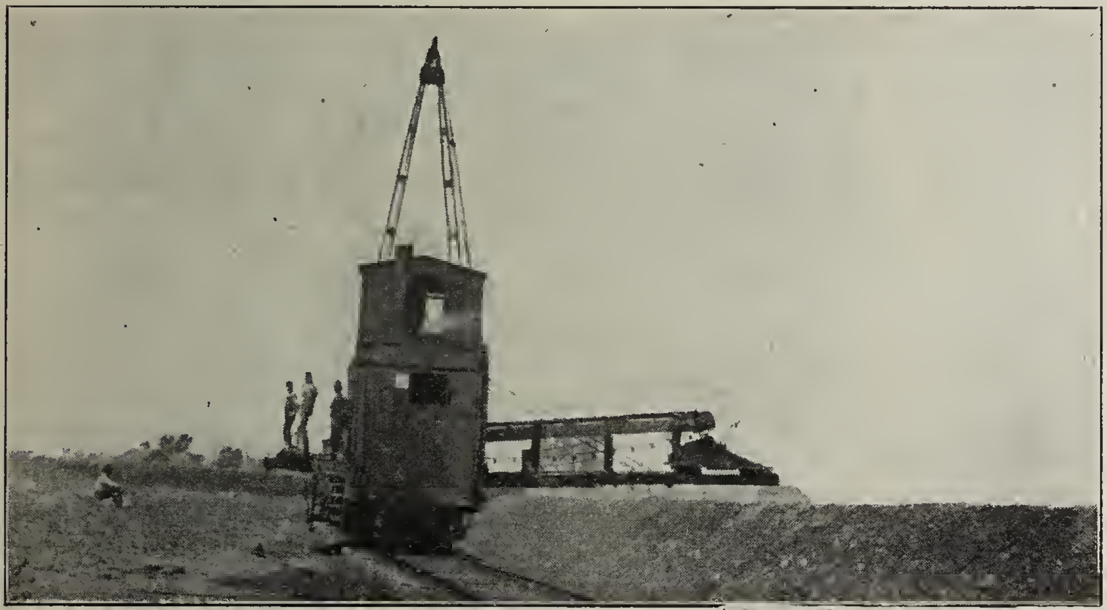
Hurrah for Harvard!

Down in Chelsea where they have to import real life so the community may not wither up and blow away entirely into Boston, and where Parry Brothers set up a giant New England brick machine on wheels to stream out bricks over 80 acres, more or less, of ancient mud-yard flat, they have some officials who know John Parry and who like their jobs. They like Parry, too.

Who could help it? But it is necessary to keep in with the labor vote sometimes in some minds in order to keep in place; and this led to an attempt to hamper Parry's big machine in its operations. Someone figured out that there was an ordinance limiting certain engines such as Parry uses to within 500 yards of the city limits, and they thought they had found Parry inside the limit. But they didn't. Then somebody had an ordinance passed compelling every man operating an engine in the city to first secure a license from the city council. Thus Parry's plant's life was evidently at the mercy of the council. But he didn't seem to mind. The Parry engines ran along just the same. Then it dawned upon somebody that there was something in the constitution of the commonwealth relating to *ex post facto* laws.

It might be added that the Chelsea city council is waiting yet to receive its first application for an engineer's license under the new ordinance.

They tell me that Fiske's, Portsmouth, plant has neared perfection in its operation. More kiln room has been made, so that the daily output of 60,000 can be obtained without a break, and that certain little difficulties caused by unevenness in shrinkage at times in the first kilns have been successfully overcome. This is gratifying news to everybody who met the Fiske's and to those whose privilege it happened to be to view the marvel of brickyard engineering at Portsmouth.



And speaking of the Fiske's I again declare that Boston is not only the Hub, she is It.

A HARVARD GRADUATE.

GERMAN CHIMNEY CONSTRUCTION.

In Germany tall chimney builders are now using a mortar composed of a mixture of cement, lime and sand (in the proportions 1, 2 and 6) for the upper portion of the chimney stack, where the gaseous products of combustion of the fuel are comparatively cool; while for the lower portion of the stack the proportions are 1, 2½ and 8. If the lime is hydraulic the proportion of the cement may be reduced; but if the sand is very sharp the proportion of cement must be increased. For the cap of a tall chimney stack the proportions of the ingredients of the mortar may be altered with economy and advantage. In German practice the mortar is composed of cement, lime and sand; in the proportions of 1, 1 and 4. Mortar made of cement and sand alone is not at all suitable for tall chimney work, because it does not resist the action of heat well and is attacked by carbon dioxide, of which there is always a large quantity present in the flue gases; this is especially the case in the presence of moisture, and, of course, steam is always present in the gases found in a smoking chimney.—*Exchange.*

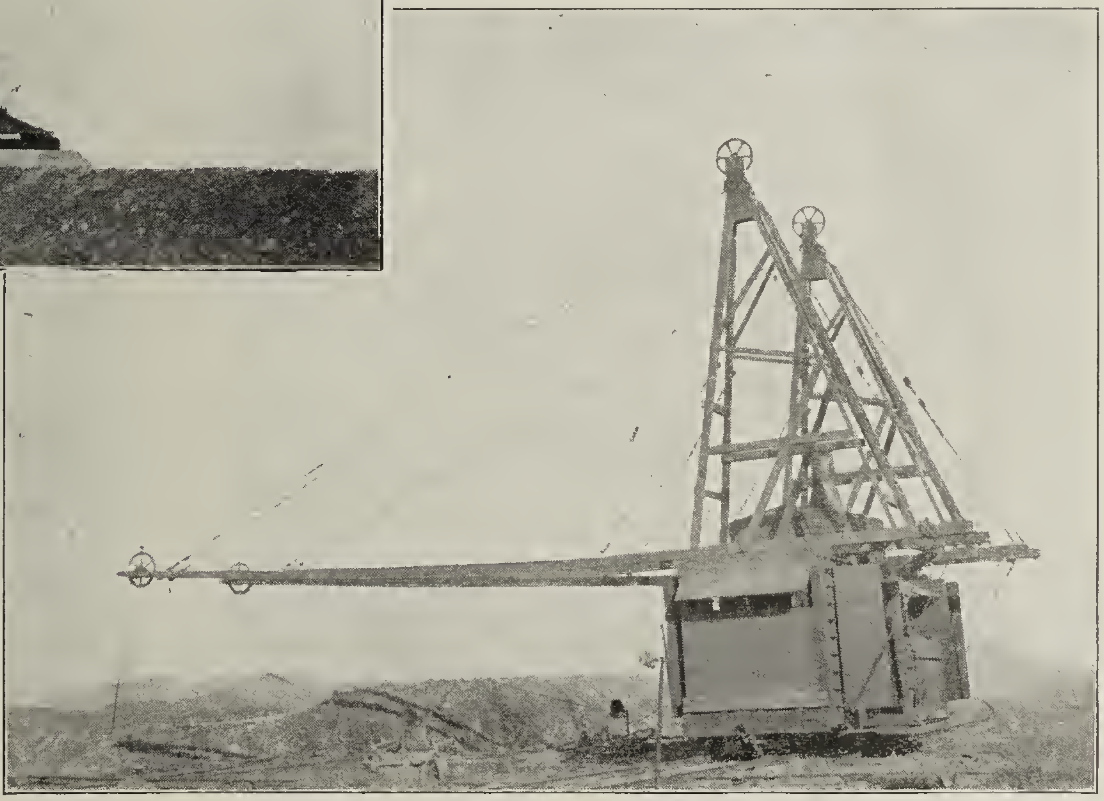
If you are in need of an experienced workman, a good place to look for him is in THE CLAY-WORKER'S "want" ad. columns.

Written for THE CLAY-WORKER.

AN UNCOMMON CLAY PRODUCT.

The Manufacture of Clay Ballast as Practised at Certain Points in Iowa.

SEVERAL BURNT CLAY BALLAST companies have established and operated plants from time to time at various points in Iowa. The material used ordinarily, consists of an extremely fine textured loess or gumbo. Occasionally an alluvial clay is used as was the case near Cuba, in Iowa County. Whatever the material used, certain physical properties are essential to ensure satisfactory results. In the manufacture of most varieties of clay wares excessive shrinkage during the process of drying and burning is always undesirable and often fatal to a perfect product. In the manufacture of burnt clay, however, high shrinkage is not only a desirable quality, but is essential to its economic manufacture and distribution. The extraordinary shrinkage causes the gumbo masses scooped out by the ballast machine to partially disintegrate under fire, at once facilitating an equable distribution of heat, which makes uniformity in burning possible, and prevents the overheating and consequently the production of unwieldy glassy boulders and clinkers. The product when successfully burned consists of fragments fairly uniform in size and requires no further treatment preparatory to use. A second quality while not so important as the first, contributes very largely to economical production. The clays best adapted to the manufacture of burnt clay commonly contain high percentages of fluxes. The upland gumbos in particular, which yield best results, are, on account of their impervious nature, almost wholly unoxidized and unleached. The high percentages of fluxes and the extremely fine textures of the gumbos, lower the fusibility and obviously reduce the cost of burning.



Apparatus for Handling Burned Clay Ballast.

The upland type of gumbo has a wide distribution over the southern half of Iowa. It is commonly present on the divides between nearly all of the more important drainage lines and varies in thickness from a thin veneer or total absence to twenty or even thirty feet. The superficial portion is charged, generally, with humus and stained a gray-black in color, when wet, to lighter shades when dry, and grades downward into an ash-gray to blue-gray, pebbleness and almost gritless deposit. The monotony of the lower portions are broken occasionally by almost white blotches of lime.

The methods used by the Davy Burnt Clay Ballast Company in the manufacture of burnt clay at Selection are very simple and very effective. Some five or six feet of the surface materials are used. A car mounted on trucks and equipped with a pair of steam shovels working from two extra long booms extending out at right angles to the car constitutes the excavating or ballast machine. In opening a pit a wind-row of combustible material, usually old ties, bridge material and other refuse, is placed at the margin of the area which it proposed to exploit. A track is laid in front upon which the ballast machine operates. The steam shovel cuts a trench as it moves ahead, depositing the removed materials on the row of wood on the opposite side of the trench by the scoops running out on the booms and dumping. The excavating car is followed by a coaling car which consists of a traveling scoop or dredge much on the same principle as the steam shovel which brings the coal to a belt conveyor, which in turn deposits a thin layer of coal evenly over the fresh clay ridge. The track is set back from the trench and the steam shovels cut a new swarth transferring the material across the trench depositing it evenly over the preceding layer. This in turn is followed by the coaling machine and the process is repeated over and over again. The first layers are fired and the fire passes from one layer to another, the process being continuous when once well under way. The amount of coal added is intended to be sufficient to burn all or nearly all of the clay, but not to fuse it. The value of the ballast depends very largely upon the perfection of the burning. If underburnt the clay slakes and becomes slippery when wet. If completely fused it adds to the expense of distribution. The product of a successful burn consists of fragments more or less uniformly sized, and may be considered an artificial gravel. The usual way of handling the ballast when sufficiently cooled is to lay a track on the opposite side of the pit from the ballast machine and coaler and use a steam shovel. Flat cars are loaded in this way or may be loaded by hand. Thus when the plant is in full blast, loading and removal follow closely trenching and coaling. Steam coal, slack and mine waste only are used for burning after the initial kindling. For economical working the pit usually ranges from one-half mile to a mile in length. The methods used in the distribution of the ballast along the right-of-way are the same as those practised in the distribution of gravel and crushed stone. In addition to the use of burnt clay for railroad ballast, it bids fair to serve as a substitute for cinders and gravel in filter beds, and for gravel and crushed stone in concrete and highway work. When the "good roads movement" assumes a more practical form the wealth of raw materials suitable for the manufacture of burnt clay may receive the attention its importance merits. S. W. B.

MANUFACTURERS' ASSOCIATION.

The Annual Convention of the Stove Lining Manufacturers' Association was held at Broadway Central Hotel, New York, on Wednesday and Thursday, December 9th and 10th.

Convention was called to order at 11 a. m., by the President, Mr. Harry S. McLeod, of Troy, N. Y., and after calling the roll and reading the minutes of the previous convention, the election of officers for the ensuing year being in order, the Convention re-elected Mr. Harry S. McLeod, President; B. C. Pierce, Secretary; J. G. Williams, Treasurer; C. B. Flint, Vice-President. The convention then adjourned to partake of a banquet given to the Association by the members thereof.

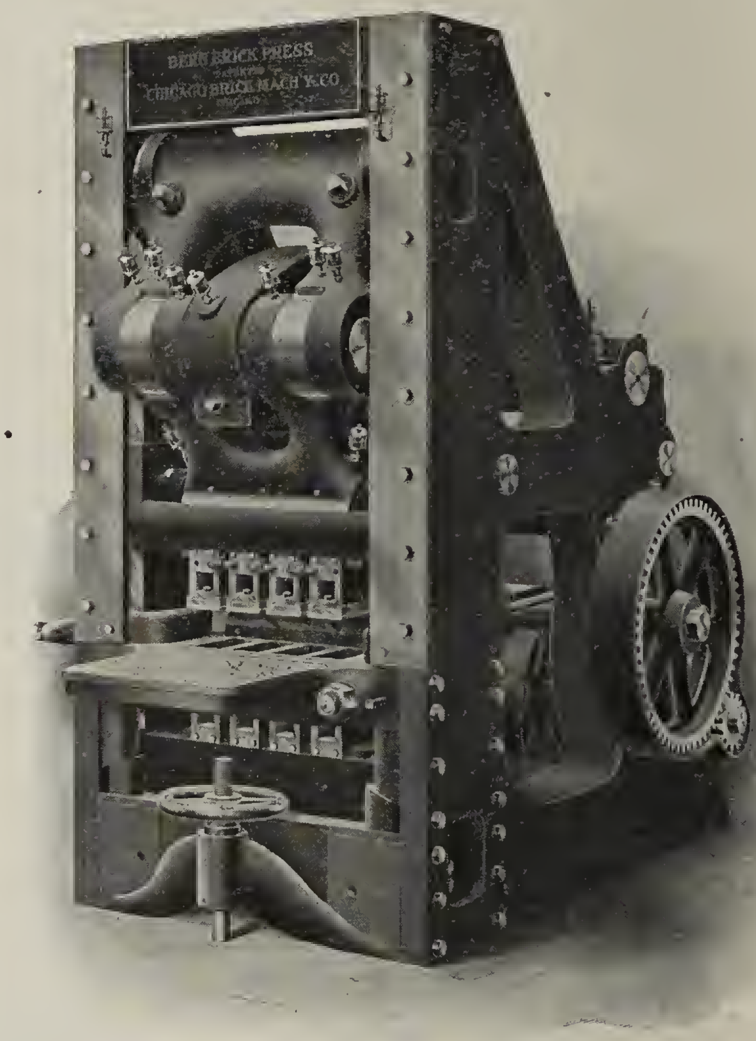
The following companies were represented: McLeod & Henry Co., Troy, N. Y., by H. S. McLeod. Presley Stove Lining Co., Taunton, Mass, by B. C. Pierce. Newton Fire Brick Co., Albany, N. Y., by C. B. Flint. Williams Stove Lining Co., Taunton, Mass., by J. G. Williams. Horton & Mabie, Peekskill, N. Y., by S. D. Horton. Rogers & Co., Royersford, Pa., by F. S. Brown. Taunton Stove Lining Co., Taunton, Mass., by J. Walter Parker. Reading Stove Lining Works, Reading, Pa., by Benj. F. Fox. Union Stove Lining Co., Taunton, Mass., by Geo. Briggs. Hall & Sons, Buffalo, N. Y., by C. M. Helmer. Brooklyn Fire Brick Works, Brooklyn, N. Y., by H. A. Perkins and E. L. Rice. R. Campbell's Sons, Hamilton, Ont., by C. C. Campbell. Dighton Stove Lining Co., Dighton, Mass, by C. A. Bloomfield.

1904 MODEL BERG PRESS.

A New Machine for Making Fine Pressed Brick of Clay or Sand and Lime.

IMPROVEMENT is the order of the age, and the well known Berg Brick Press is leading the procession with a new 1904 model, which is illustrated herewith by two cuts showing front and back view.

On this new model, the driving mechanism is placed in the rear as shown instead of at the side, doing away with the pulley stand, and enabling this machine to be shipped as one piece. It is simpler, more compact, and even stronger and heavier than before, and is all self-contained. The manufacturers claim that this is the coming type of Dry Press which seems now to have reached its simplest form.



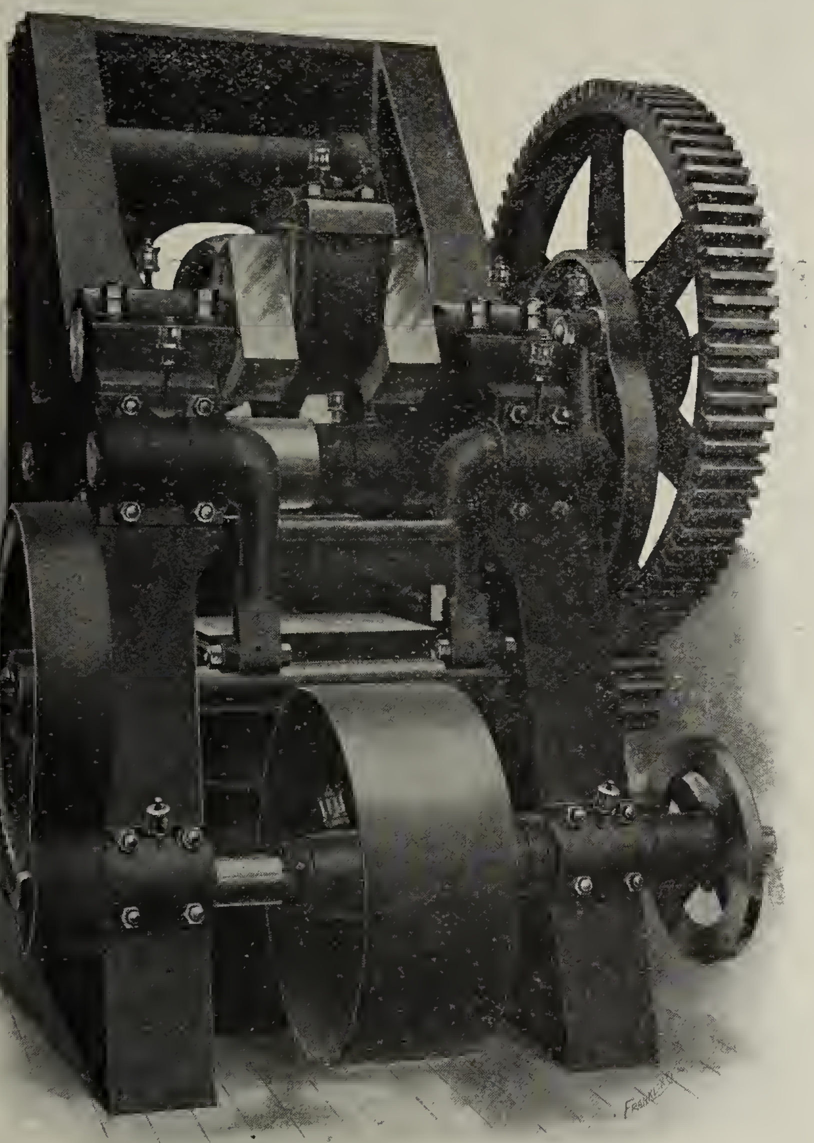
Front View of the 1904 Model Berg Press.

In this class of machinery simplicity and strength are what all manufacturers strive for, and the Berg Press is claimed to have the fewest and largest working parts of any dry press on the market, and it has no wearing parts whatever below the mold table. All brickmakers who have used this class of machinery know that the finely ground dry clay always scatters more or less and is bound to cut any bearings that are below the mold table. The tendency of all modern machines, therefore, is to have no bearings or journals below the clay line.

This is a triple pressure machine, and it is claimed that it will put more clay into a brick of given size than any other dry press on the market. It presses first from the top, then from the bottom, then passes the center and relieves; then comes the third pressure from top and bottom together with a movement of the brick under pressure in the molds which prevents any granulated seam or weakness in the structure of the brick. Where it is difficult to get the air out of any particular clay, this machine can be arranged so that the plungers come to a dead stop while the brick are under pressure, thus insuring a perfect bond in the most difficult materials.

The mold box is of course the vital point of any dry press, and every one who has made any study of dry presses knows the Berg Mold Box, which is conceded to be the simplest and most practical in the market. It is only necessary to remove one bolt to loosen the entire mold table so that liners may be replaced with new ones or ornamental shapes quickly and easily. The same bolt tightens the table so that even with reground molds there is no change in the size of the brick. This mold has had many imitators since first brought out, but no equals.

This press is not only in the lead for making high grade building brick and fire brick from all kinds of clay and shale, but is also used more extensively than any other press in the making of the new sand-lime brick by the various German and American processes. This is conceded to be the hardest work on a machine that there is in the brickmaking line, and speaks for itself as to the reputation of the Berg Press.



Back View of the 1904 Model Berg Press.

This Press is well known and is manufactured by the Anderson Foundry and Machine Works, at Anderson, Indiana, and sold by the Chicago Brick Machinery Company, No. 225 Dearborn street, Chicago.

A GOOD SUGGESTION FOR TAX GATHERERS.

By a new law the men of Sweden are hereafter to pay a tax by weight. When the weight of one hundred and twenty-five pounds is attained the tax begins, and the man weighing one hundred and eighty pounds will pay double the sum assessed against his lighter fellow. Tax-dodging by certain stout persons in the United States might be prevented by the adoption of that system here.

THE MINERAL WEALTH OF TEXAS.

Vast Deposits of Clays, Kaolin and Stone Yet Undeveloped.

THE WEALTH of Texas in clays, kaolin and building stone, according to Dr. Heinrich Reis, professor of economic geology in Cornell University, who is in Texas to examine the kaolin and clay deposits of the State for the World's Fair commission, is far greater than he supposed. He has by no means finished his task, having covered only a part of the State, but he says he has seen enough to convince him that Texas is probably richer in these deposits than any other State in the Union. Up to a few days ago Dr. Reis had gathered thirty-five samples of clays and kaolins himself, and an assistant had gathered a number in addition. His work so far has been mostly in South, Southwest and part of West Texas, and now he is carrying on his investigations in North Texas. He was in Dallas this week making an investigation of the limestone and clay deposits near this city, and from here he went to Thurber, on the Texas and Pacific, to look into the deposits of clay there, which are, perhaps, the most extensive in the State.

When asked as to his conclusions concerning these deposits throughout the State, Dr. Reis said:

"I have been almost astonished by the variety, quality and quantity of the clays and kaolins in Texas. I had known that there were considerable deposits of these materials in the State, but I had no idea they were of such immense commercial value. I have found in every section of the State clays which make an excellent brick and which burn to a beautiful color. The presence of these clays is very generally known, and they are being utilized as much, perhaps, as is practicable at this time. But information concerning the kaolins is not so general, and, apparently, few men appreciate their value. Dr. Phillips and I recently visited a deposit of kaolin in Edwards county, far from a railroad. This deposit has been worked in a desultory way for several years, but now the shafts have caved in largely and one might say that the place has been abandoned. We got samples, but not such as we wanted, as the shafts had been washed in and we could get only half way to the bottom.

"I have also found a very valuable quality of clay in Fayette county, close to Muldoon. This deposit crops out several places below where it was first found, and I saw evidences of it as far down as Gonzales county. I have not made an analysis or test of this kaolin yet, but I was shown the report of an analysis made some time ago, and I have no hesitation in saying that if this analysis is correct, this is one of the most valuable deposits of kaolin in the world, if, indeed, it has its equal in any part of the country. The peculiarity of this kaolin, according to the report of the analysis shown me, is that it is impregnated with magnesia. The value of this can be appreciated only by the potter and maker of fine china. This chemical property permits the burning of the kaolin at a lower temperature than is possible with any kaolin without it. Not only that, but it burns to the purest white and to a thinness which makes it translucent. For the making of belleek, or, as it is better known, eggshell chinaware, which is one of the most costly of chinas, this kaolin is especially valuable.

"I have personally gathered about thirty-five samples of clays and kaolins. As yet I have made no chemical analysis and will probably not be able to do for some time, as the time intervening will be taken up in getting additional samples. I shall make the chemical analyses at Austin, but I shall not make the physical tests until I return to Cornell University. I have induced a friend of mine, who is a potter at Trenton, N. J., to work up some of the finer kaolins into articles of ornament and use. The samples for this purpose will be selected after the chemical analyses and physical tests are made. These articles will show what can be done with these kaolins, and they ought to be effective in leading people to appreciate the value of these deposits of Texas."—*Exchange.*

Written for The Clay-Worker.

HOW ROOFING TILE ARE MADE.

An Ancient Clay Industry Modernized—The Splendid Plant of the Celadon Roofing Tile Co. and Its Products.

By Prof. C. F. Binns.

SCIENTIFIC MEN have plunged into the distant past in a search for the origin of roofing tile, but, so far, without success. Very early types of sloping roofs have been discovered, but so far as relates to the covering of them with a slab of burned clay, the roofing tile of ten or eleven centuries ago was practically identical with that of today.

Wm. R. Clarke.

The application of terra cotta to this purpose was evidently made in several quarters of the globe spontaneously, for so many types of tile have been developed that there could have been no suggestion from outside. In fact, at the date when tile were first made there was but little communication between the nations. In many instances the tile became highly ornate, and the forms used gave rise to interesting and decorative features in the roofs to which they were applied.

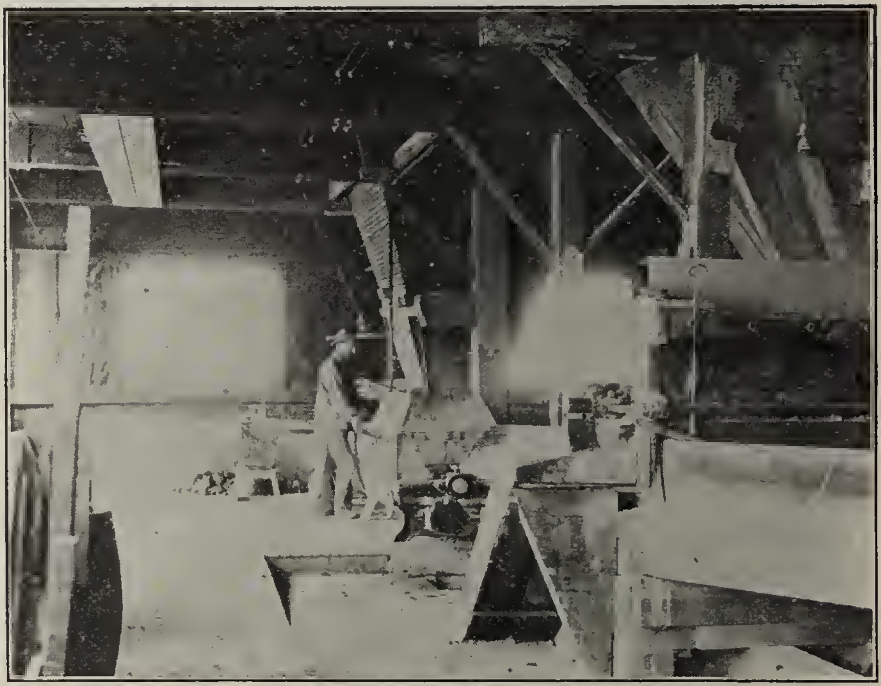
In this country, the industry is of quite recent growth. Professor Morse, writing in 1892, says: "It is a curious fact that a material so cheap, durable and picturesque, and one so widely distributed throughout the world, should not have effected a lodgment in this country," and again, "With the best tile clays in the world and an abundance of the rude labor usually employed in tile making, there is no reason why roofing tile should not come into common use in this country, as they have in all other parts of the world."

Professor Morse would, doubtless, tell the story in a somewhat different strain now. Roofing tile have come to stay, but the highest grades are made of shales rather than of clays, and the "rude labor" is done by intelligent workmen and commands a fair price.

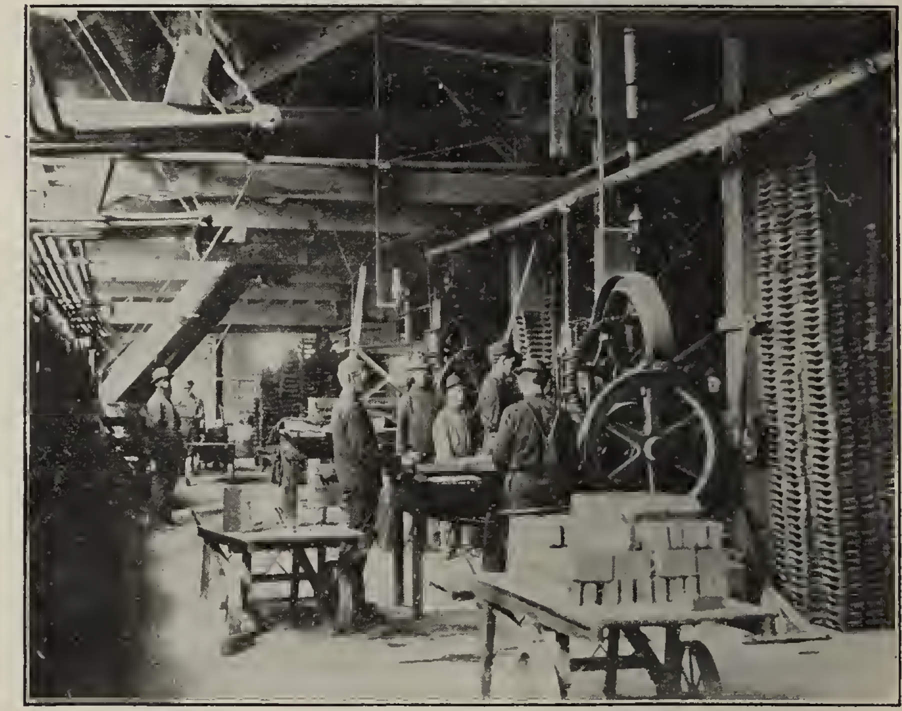
The Celadon Roofing Tile Company, with factories at Alfred, N. Y., and Ottawa, Ill., was established in 1888. Its first product was brick and terra cotta made from the body of clay underlying its extensive properties at the first named place. This clay, when salt glazed, took on a beautiful sea green color, and this suggested the name "Celadon." Work was begun on a small scale in an old frame building, which cost seventy-five dollars, and the green glazed brick commanded a good price. There were excessive losses, however, and the attention of the management was directed towards some material which should shrink less and secure greater uniformity. At this time, Mr. William R. Clarke, one of the original incorporators, and now president of the company, conceived the idea that roofing tile might be profitably made. He enlisted the co-operation of Mr. George H. Babcock, of Plainfield, N. J., who is well known as one of the patentees of the Babcock and Wilcox boiler, and together they wrought the matter out. Mr. Babcock visited Europe about that time and examined with great care all the types of roofing tile he could find. The cities of Germany and France, the eastern counties of England and even the countries of the Orient, were scoured for ideas, and he returned home with a mass of information. The results of this study proved the foundation upon which the success of the works was to be built. Mr. Babcock designed a number of tiles, and patents were taken out on some thirty shapes.

All the ancient forms of tile consisted of two parts, the tegula or roof proper, and the imbrex or convex piece to cover the joints. One of the few exceptions to this was the tile now called the "Spanish roll" in which tegula and imbrex are in one piece, the section of the tile being like a portion of the letter S, a reversed curve. The Spanish roll was again modified by the Cela-

Finishing Cresting and Hip Rolls.



At the Pug Mill.



The Press Room.

don Company, to produce an interlocking tile without the corresponding drawbacks. Many of the company's exclusive patterns are made on this principle, the parts of the tile exposed to the weather being set off by interlocking flanges, making leakage impossible. The search for a material resulted in the discovery nearby of a particularly fine bank of Devonian shale. This material belongs to the Chemung group and analyzes as follows: Silica, 53.20; alumina, 23.25; iron, 10.90; lime, 1.01; magnesia, 62; alkalies, 2.69; sulphuric acid, .91; manganese oxide, .52; water, 6.39—99.90.

The shale rises clean and clear to a height of 120 feet and the cover is very thin. The material is blasted and conveyed to the factory in wagons. At the factory, a Lancaster crusher negotiates the larger blocks and two nine-foot dry pans receive the crushed material, together with the shale, which can be ground without a preliminary crushing. No other preparation is necessary. The material is all sufficient for its purpose. Elevated to the top of the building and discharged on to a centrifugal screen, the fine powder is received in large hoppers, to await delivery to the pug mills. Of these, there are two and they are kept in constant use. The transfer of the mixed shale to the machines by gravity is upon the usual plan and on the floor below two Centennial auger machines complete the working of the material and express it for the blanks.

The shale is run very stiff and the die on the machine is so shaped that the clay column can be pressed into tile with the least possible strain. A wire across the die mouth divides the clay horizontally and a board delivery table cuts the blanks vertically.

The plant comprises eight presses, five of which are run by power, and three, for small work, by hand. The principal power presses are of the pentagonal revolving type, certain improvements, on which the firm holds patent rights, being incorporated. The blanks received from the machine are well oiled and fed to the press at one side, a gang of men removing and trimming on the other. The tile are then placed upon pallets and racked on cars for the dryer.

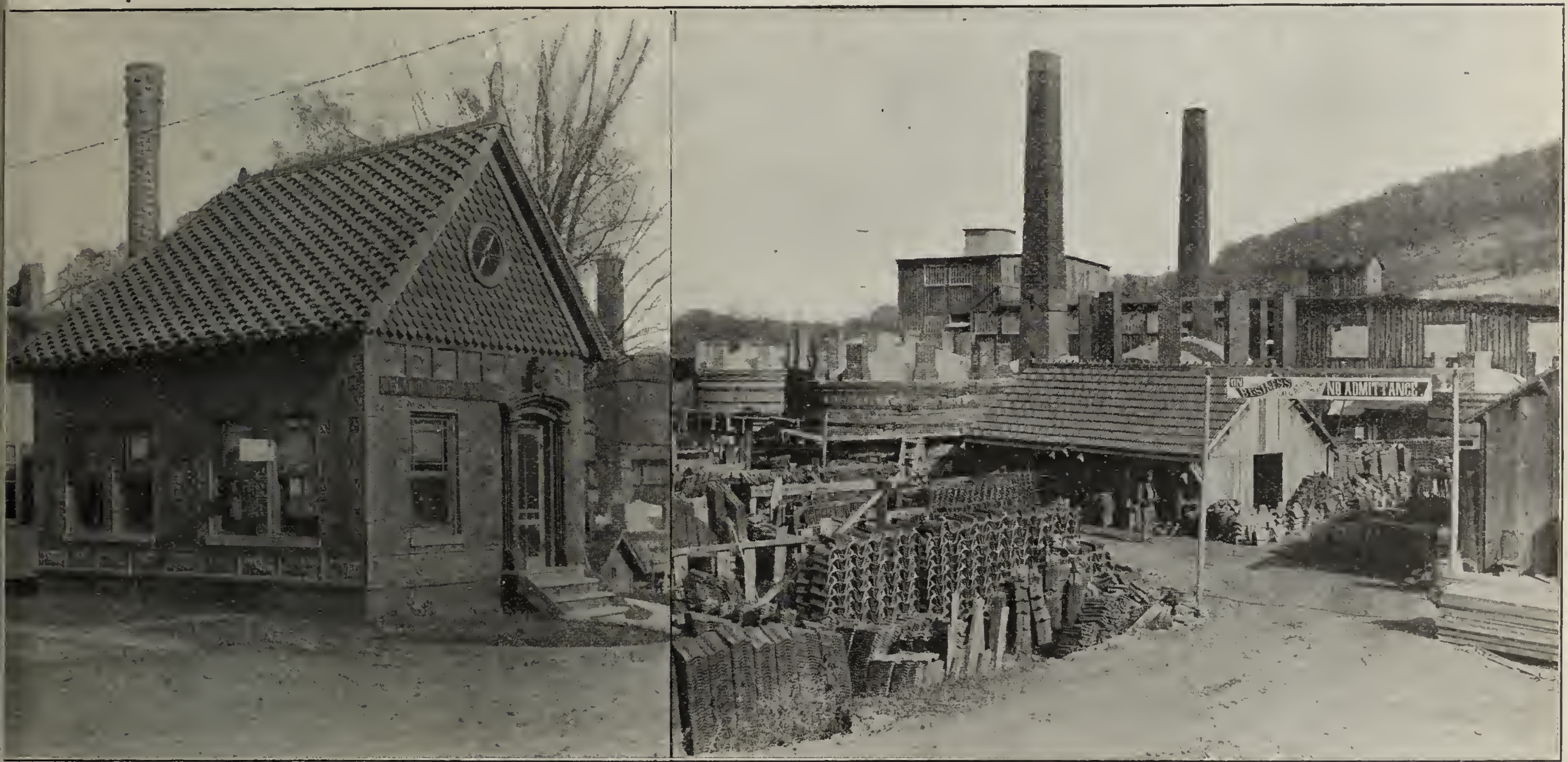
An important feature of the tiling of the Celadon Company is the care bestowed upon cut work. Every job is planned in detail. Every hip and valley is laid out in full on the floor. Every cut tile is marked and a plaster form made to the exact angle required, and to this the tile themselves are shaped while green, and marked each for its own place. By these means, an accurate fit is assured and chipping while laying is reduced to a minimum, being necessary, in fact, only where the fire has caused slight departures from the required form.

The power used at the works is generated from natural gas. Six Ruger gas engines, connected in three couples, supply 180 horsepower, and an independent engine of 15 horsepower runs the fan for the dryer. A boiler for steam heat, with a full equipped machine shop and forge, complete the engineers' department.

The excellent surface imparted to the tile by the polished steel die is very difficult to match in trimmings, and a great deal of expense is undertaken by the company in order to overcome any difference in quality and appearance. The hip rolls, crestings, finials and ornamental pieces are pressed by hand in plaster molds. The surface left by the plaster is always more or less broken, and, therefore, every piece is carefully finished by the workman before being set out to dry. This is a tedious performance, but there is no other way to secure a perfect surface, and the results prove that the trouble is abundantly justified. All this fancy work is dried on an open slat floor, which lies above the dryer proper. This consists of six tunnels and a stack, the heat required being drawn from the kilns. By an ingenious contrivance, the invention of Mr. Clarke, the heat and moisture are drawn from the floor of the dryer instead of from the roof, and the draft is quickened by a jet of hot air projected directly into the stack.

The kilns are nine in number, circular in form, and downdraft in action. The firing is done with natural gas, and a temperature of Seger cone .06 is reached. The tile are set in pockets formed of fire-clay slabs and props ranged around the kiln, much after the manner of terra cotta. The shale burns uniformly to a good red, except where the color has been purposely modified by the introduction of an oxide or imported clay.

The company has a large number of contracts now in course of completion, among which are, the Army and Navy Hospital,



Factory Office and Plant of the Celadon Roofing Tile Co., Alfred, N. Y.

Washington, D. C., to consist of twenty-six buildings; the League Island Navy Yard, Philadelphia, Pa., four buildings; the Scranton County Hillside Home for the Poor, Clarks Summit, Pa., four buildings; the residence of Mr. Thos. Cantley, General Manager of the Nova Scotia Steel and Coal Co., New Glasgow, N. S.; the residence of Mr. James Bailey, proprietor of the Barnum and Bailey Consolidated Shows, Mt. Vernon, N. Y.; and a large number of other residences, public schools, libraries, and commercial buildings throughout the United States. It has increased the capacity of its Alfred plant over 33 per cent. during the past season, but to enable it to keep pace with its constantly increasing volume of orders the erection of a new plant next spring is contemplated.

The officers of the company are: William R. Clarke, president; C. Laton Ford, first vice-president; E. S. Marvin, treasurer; Eugenia L. Babcock, secretary; Henry S. Harris, second vice-president and western manager, and Alvord B. Clarke, general superintendent. The offices of the company are at 156 Fifth avenue, New York, and at 204 Dearborn street, Chicago, Ill.

The roofing tile industry is in its infancy in this country, as compared with Europe or even Mexico, but it is growing with enormous strides, and the Celadon Company occupies front rank in being able to meet the increasing demand for these goods.

Roman Legion's Brick Works.—At Xanthen on the lower Rhine, Paul Steiner and Dr. J. Steiner recently uncovered and extensive Roman brick works, near the river Rhine, in a rich clay district. They found specimens of all the principal kinds of bricks of Roman times, roofing tiles, wall and floor tiles, common and front bricks, etc., and about 500 brick molds, each with the mark of the division of the army for which the goods were intended. These were the 15th, 16th, 22d and 30th legions, also Cohort II Britannorum. Judging from other surrounding discoveries it was concluded that this extensive installation dated from the beginning of the fourth century of the Christian era. These works must have supplied bricks, not only to the great Roman camp of Xanthen (Castra Vetera), but also to the rest of the lower Rhine, for which purpose their accesibility made them very suitable.—*Exchange.*

Written for The Clay-Worker.

THE NEW NATION.

Panama, Its People and Their Homes—The Key to the New Industrial Life in Central America—Increased Trade for the Manufacturers of the United States—Better Living for the People of the Isthmus.

THE CREATOR DID a kindly thing when the Isthmus of Panama was made so narrow, but it took the white man a long time to take the hint. We did the least logical thing first. We built transcontinental roads. To be sure, transcontinental roadways were on our own territory, in our own country, but it doesn't take so long to acquire or steal or buy as it does to build. The Suez Canal occupies about the same relation to the Eastern Hemisphere that the Panama will to the Western. In relation to its commercial development, however, the builders of the Suez Canal and the national interest which promoted it, showed a more highly developed commercial sense than have our people in their tardy measures relating to the building of the Panama Canal. With a cut of about forty-five miles we will have practically a free waterway across the continent. We will have one under the direct control of our people, not a monopoly. The people, through the government of the United States, more than paid for the early transcontinental roads and turned them over to corporations managed in the interests of relatively a few stockholders. The people, through the government, furnished the money and then practically gave the property away. In the Panama Canal there will be a great transcontinental waterway equal to the building of more than half dozen great railroads from the east to the west. It will be free from monopolistic and selfish control. The interchange of products from the east to the west will then be at the lowest possible cost, and the transcontinental railroads will have a competitor more powerful than any other form of competition.

It is only within the past twenty-five years that the Panama

Tropical Scenes In And Near Panama

Natives of Panama and Their Homes.

Canal could have been of any extraordinary benefit or decided value to our people or to the world. Prior to the late seventies ocean steamships were not formidable as freight carriers. The marine machinery was too heavy, occupied too much space and consumed too much coal. For the transportation of passengers and freight having large value in small space it was satisfactory. For performing a general carrying trade of the heavy and bulky articles of commerce it was not satisfactory. A steamer of the old kind capable of carrying three thousand tons might set sail on a voyage so long that she would be compelled to carry 2,200 tons of coal, leaving room for only 800 tons of freight, whereas at the present time a steamer with compound engines makes the same voyage by carrying 2,200 tons of freight with a consumption of only 800 tons of coal. The result of the construction and use of compound engines, and a better design of boilers in economizing fuel has been well illustrated by a distinguished English economist in the statement that a small cake of coal which would pass through a ring the size of a shilling when burned under modern boilers and the steam generated used in compound engines in a modern steamer would drive a ton of food and its proportion of ship two miles on its way from a foreign port. Another calculator, says the *London Engineer,* has computed that half a sheet of note paper will develop sufficient power, when used in connection with triple expansion engines, to carry a ton a mile on an Atlantic steamer. Thus, with this very great reduction during recent years in the carrying charges of freight the Panama Canal will assume an importance and a measure of economy which a short time ago could not have been possible. The steam equipment of ocean traffic has been improved much more rapidly and to a much greater extent than it has in the locomotive.

The commercial importance of the Panama Canal to the United States and to the world is not to be estimated, and its decided and peculiar advantages to the United States of America are simply tremendous. There are certain sections of the country, particularly that part that the Lord forgot when he was in the business of creation—the great Western Desert—which may have taken from them even the little which they have on account of this Panama Canal. But the country at large all that have products of any kind to sell, buy or exchange, will find themselves incalculably benefited. This great, free channel of commerce is of great importance to all parts of our country. Indirectly every clay industry will profit by this enterprise. It is great because it is a channel, and it is greater because it is relatively free and under our control.

The recent revolution in Panama reflects the spirit of the times in a way as truthful, as graphic and as startling as it is picturesque—a revolution that was bloodless, a revolution carried on solely through the power of the dollar, a revolution carried on on business principles, no friction, no lost time, no lost motion, no blood spilled, no sentiment, no patriotism. This was the Panama revolution Thus was the District of Panama separated from the corrupt and diseased Republic of Colombia. The newly created State embraces within her borders the canal channel, covering a strip of territory about twenty miles wide which is to be placed under the dominion and patronage of Uncle Sam. Panama wants the canal, we want to run things; Panama knows that we can build the canal and will build it, and with absolutely no feeling of a patriotic character, without the quickening of a heart beat from a sentimental standpoint, she rebelled and set up a new government.

The administration at Washington has been accused of taking a hand in this little piece of statecraft and of lending aid to some of this machinery of revolution. In the first place, the United States government did not have to do anything of this kind. She was never asked to do it and never had the opportunity to do it All the United States had to do was to act in the position of a governmental chaperon, recognize the Republic of Panama and stand sponsor and form a sort of protectorate. A few men on the Isthmus, not over seven, together with those controlling the management of the Panama Railroad on the Colon side and some local capitalists on the Panama side were responsible for the whole business. The Colombian government had been bleeding these gentlemen for a good many years. They had squeezed all the substance possible out of their own people. From our point of view the Colombian government was rotten clear through. They robbed their own people and everything and everybody within reach. This little handful of capitalists and manipulators of Panama knew that the Colombian government would not raitfy the treaty with the United States unless the government at Washington were to go down there with a big pile of money and bribe the measure through. This Uncle Sam would not do. The seven men of Colon and Panama put up about $350,000 and got rid of

Part of a Typical Seaport Village of Panama.

the Colombian contingent, soldiers, sailors and officers, set up the Republic of Panama, asked for the recognition of the United States government, which they got, and their patronage and promise to build the canal. They got exactly what they wanted and we have what we want. The canal will be built through Panama, that is what they want; we will control it, and that is what we want. To be sure, some of our people from the north furnished money to lubricate the Colombian officials, but that is no business of our government.

Whether all this sort of thing may be right from our point of view or not, the fact remains that this is the best and only way that this canal business could have been settled. The people of Panama care little or nothing about the whole matter so far as it relates to government. All the leaders have to say is, "This is the form of government that is going to give us the canal." These adult children care for nothing more. The United States to them means canal and nothing more. There is a certain form of tradition and memory relating to the period when the French were at work on the canal. Some of those who live in the country, who have a little patch of ground and imagine they are farmers remember that they sold chickens and things when the canal was being built. They are for the present government and the United States government which promises the canal. This is all there is to it. It is the canal, not the government. This is the center of it all. The mass of the people would have been perfectly satisfied with the Colombian government or a monarchy or anything else if it had carried the canal with it. This is true of the merchants in the city as well. When the canal was building before, there was money in circulation and the merchants and the townspeople, the saloonkeepers and the gamblers and everybody got a chance at it. So long as the government means the canal it is all the people care for. A few individuals are glad enough to have a republican form of government, but it is all a question of individual interest and is not nearly so broad as patriotism.

What about the people? Those of us who have been with them, those of us who have seen them understand a little. We see a short distance under the surface of this remarkable situation. We know that from our point of view their moral standard is nil and that if they have a moral standard of their own we do not know what it is. We know what they do not know that the few of us who may go to Panama will ultimately wipe them out. We know that this type of mixed Latin and the Anglo-American of the North can not long exist on the same strip of ground. We know that without appearing to be very aggressive, certainly with no evidence of viciousness, we will dominate that section. The thing which makes the Anglo-American so dangerous and destructive to any other race with which he comes in contact is the fact that he is so dead sure he is right. I never even met an Anglo-Saxon who claimed to understand that mild type of Latin which we find in France. How can we expect to sympathize with and hence understand this accentuated Latin-Spanish-Indian mixture which was originally bred out of the cruel heel of Spain? A race which the Anglo-Saxon does not understand he discredits. As soon as the mercenary and misisonary spirit of our race gets a little grip on this Panama strip it will ask the natives to buy school books, whiskey and bath tubs. Now the native Panamaian wants none of these things and any one of them, if forced on him, will kill him. We Americans have our idea of civilizing another race. It consists in having him do everything that we would have him do, casting off all of his race characteristics, eating what we would have him eat, wearing what we would have him wear and working as we would have him work, most of all thinking as we would have him think. We would ask him to be happy in our way. We would take from him his dirty fevers along with his easy mode of living and trade in nervous prostration, paralaysis, appendicitis, Bright's disease and the work habit. This is the American view of civilizing another race. Another thing, we will ask him to buy all his goods from us, and we will not want him to sell to us, except under such tariff regulations as will enrich us and impoverish him. The weaker race rather than do all these things will find the avenue of death the easiest way out of it, and he will accept it.

The view which one gets of the people of this republic at Panama and Colon is somewhat cosmopolitan. There are Americans, native Spaniards, Germans, Hebrews, a few educated natives and altogether just that kind of people whom one might expect to find where there is trade and commerce. Back in the country, along the railroad, up and down the coast and bordering the various inlets from the sea, one finds the Panamaian in his raw state. He doesn't work, because he don't have to work. The lazy man's bread—a banana and a plantain—are always at hand and in other ways the world issues forth its abundance. With the American, laziness is a vice because industry is necessary. With the native Panamaian, laziness is not a vice because industry is not necessary, and whenever we undertake to make him work in our way and from a necessity which we place around him, he will pass out of this life and the land will be ours. We have one code of morals and the Spanish-American another. We do not recognize his nor does he understand ours. Whereat we say to him that he is wicked. Very few of the Panamaian women care to marry. They prefer to be merely mated. "If I marry him," says the woman, "I am his slave. He makes me work and otherwise does with me as he pleases. If we are merely mated I can quit him when I please and by compulsion he must be good to me or leave me."

What has all this to do with the clay industries? In so far as we are interested in the extension of our own business and the extension of general business, it is a matter of great and vital importance. It means the sale of brickmaking machinery and eventually the sale of certain special kinds of brickmaking material. It means a new field for the manufacturer and the workman. The nation or the individual which is not looking out for new territory or new business will die an untimely death. Our government has been reaching out ever since it was formed to include the thirteen original states. The firm or the individual manufacturing brick or brickmaking machinery or anything else that people will buy, who is not looking out for an extension of field will succumb under the efforts of those who are more ambitious. Germany has been particularly successful in its trade with the Spanish-American countries from Colombia north to and including Mexico. Great Britain and Germany as well have a strong hold on the trade of South America. The trade of our own country is relatively small compared with that of the English or Germans. Under the stimulating influence of our new department of commerce and the realization of the real facts as exhibited through our trade journals, we may expect educational benefit which will redound to the credit and benefit of the American merchant, manufacturer and other producers. The relation of our government to that of Panama makes new trade in that section not only probable, but as certain as our efforts to secure it. While the clayworker's share of these benefits may not be great, indirectly they are important.

Many of the buildings of Panama and Colon are of the substantial character that we find in all Spanish and Spanish-American cities. Structurally, they are well built. Many are pleasing in design and few or none are offensive from an artistic standpoint. There is no object in any amount of expensive cut stone work or a high grade of brick work. Walls of stone or badly made brick built in with mortar or concrete with decorations of stucco or plaster are fully adequate for the requirements of this mild climate. The roofs are of tile, metal and sometimes concrete This is for the buildings within the cities. Immediately outside, excepting in rare instances, even nails are not necessary in building a house. Poles and sticks tied together with thongs and covered with thatch or bark and with only occasional crude bits of masonry form the home of the typical native. It is as good as he wants, and as good as he needs. The maintenance of a swifter life would destroy him. The American with no other thought than the good of a Spanish-American race would eventually wipe him from the face of the earth. Our idea of virtue and work is death and destruction to the Spanish-American.

LOUIS H. GIBSON.

He is a wise Brickmaker indeed who knows it all, and rare.

Written for The Clay-Worker.

BUTTONHOLE TALKS.

The Equation of Life.—A Tropic Reverie.

THE SUN was dropping below the horizon and the western sky was radiant with yellow light in which a few fleecy, delicately tinted clouds floated, giving an indescribable airiness and softness to the sunset. Against this gorgeously brilliant background the great pines stood out sharply in dark dense profile. Rolling along up the bay came the thunders of the sunset gun at Fort Morgan. As I sat on the Gallery in the hush of the evening, drinking in the beauty of the sunset, there came floating across the river the musical sound of a bell, the angelus from the little church on Mon Louis Island. As the sound came to me its soft, pleasing cadence put me in a dreamy mood: in imagination I saw the inhabitants of that happy and contented island turn at its call, with uncovered head, murmur their evening prayer. Honest, reverent, devoted to their church and diligent in their work, the inhabitants of that quiet and out of the way island, humble and remote as they seem, have won the respect and esteem of all who know them by their steadfast respect for the statutes of man and the laws of God.

W. D GATES.

Then I thought of the dead and gone founder and ancestor and of his wife, who left surviving her one hundred and five direct descendants and died at the age of one hundred and ten, all too soon for Roosevelt to hang medals on her; of the romantic story of their settlement of this island (but that's another story, as Kipling says). I thought of the venerable sons and daughter of this couple still living there where they were born, counting their years up toward the hundred and yet active and quick of mind. Then it came to me how out of the way was the island and its inhabitants and of how little the great world knew or cared for them or their joys and sorrows; of how like to them was one day to another day and one year to another year in their unchangeable monotony; and yet though they were unseen by the world and out of its thoughts and out of its sight, yet might they not still be nearer to their God than we outsiders, in the whirl of the great, big outside world, who were pitying them. And then I thought of how quietly they lived and of how just they were. How few were their wants and how simple as well. How content they were. How quietly they slept, and what a store of health and wealth of years they had, and that if their life was quiet and commonplace it was free from the rush and bustle and push that wear us out and drive us mad. If their food was simple and they lacked the little delicacies and nick-nacks, which we almost consider necessities, that they also had none of the dyspepsia and kindred troubles that we get along with our luxuries, and if they do miss the modern rush and clatter of civilization, do they not miss the sin and soil that our twentieth century carries with its so-called advancement.

Way out across the bay the alternate red and white winks of the "Middle Light" came to me as they flashed out, to welcome the coming and speed the departing ships, as they bore their commerce on and past. Then the lights on "Mon Louis" began to go out, until the island showed blacker and blacker, until it was blotted out, only to stand out again as the moon-rose big and bright from the waters of the bay and flooded the island and bay and river with its silvery light. The rippling waves caught its brightest beams and leaped and played with them. The great pines caught its light, but held their shadows and cast them back, throwing them far along the ground. Then the breeze sprang lightly up and sang me its most restful song as it played through the tossing tassels of the long-leaf pines overhead.

So I forgot toil and labor and rush and bustle and strife and heartache, way down there in an out of the way corner of the Southland, and grew content and happy in getting close to nature and her simplicity and honesty.

Gates.

BY THE LIGHT OF THE KILN FIRE.

Burning Common Brick in Scoved Kilns.

AS WE SIT around on the wood piles under the eave shed of the old scoved kiln and talk over the ways of making and burning, one of the boys from the other yard says, "How do you get such good burns with a scoved kiln?" I will answer, that thirty years of making and burning by many different methods will teach you something as it has me. I burn a common kiln of brick a little different from most of the burners. In the first place I watersmoke slow for twenty-four hours, and increase the fires a little at a time until the kiln is clear on top before I run any wood into the center, then I work the brands and coals in with the kiln rake or ramming rod until the fire is across the full length of the arch, giving plenty of draft to keep the fire alive, then commence running to the center and as soon as the arches get a light red I seal up one side of the kiln for twelve hours and then change fires; that is, I close up the other side and keep cross-firing until the kiln is hot all over the top, and you will find it will be an even red hot top all over the kiln, then close up the hottest head and do not change fires until finished. After the arches are red, fire with closed doors leaving from one to two inch draft. I have known some to fire with open doors until the arches are red, but you will burn up more wood to finish the kiln by one quarter than with closed doors. This way you can get the heads piping hot. After the kiln is hot, keep the arches an even color, according to what your clay will stand, and don't get in a hurry to get through. Watch your top right after you put in a fire, and go up and look it over just before you put in a fresh charge.

If your fire works where you don't want it to, change the draft in the arch that needs it by opening or closing the door a little until the smoke or fire comes out at the right spot. You can throw your fire to any part of the kiln in this way. I set my heads open and the outsides the same, leaving a two-inch opening around the whole kiln. This acts as a flue. I set my top courses tight, except on the heads and outsides. Some object to a tight top course, but I find it better. With a good course of platting on top of the tight course, then you can keep the heat in the kiln. Where the top is loose, the heat that escapes would keep a balloon in the air over the kiln as long as it is hot. I set five and six in a bench and burn them all good veneering brick. I set my brick a little different in the arches, than the old way, and we can figure on only one soft course on top and one around the outside.

J. D. P.

Manganese Poisoning.—The Hamburg municipal report describes cases of poisoning among workpeople employed around a manganese mill, although the mill was boxed in. The poison showed its effects in extraordinary nervous affections, producing mask-like contractions of the face, involuntary laughing, walking backwards, lameness and cramps of the muscles, etc. That these effects were due to manganese was considered proved by the physicians finding manganese in the urine of the patients. The cases were very serious, but none have occurred since better ventilation has been enforced by the authorities.—*Keram.*

The Clayworker who does not know it all, but is willing to know more, should attend the N. B. M. A. Convention at Cincinnati, Feb. 1 to 6, 1904.

THE ILLINOIS CLAYWORKERS ASSOCIATION'S ANNUAL CONVENTION

PROCEEDINGS TWENTY-SIXTH ANNUAL CONVENTION, ILLINOIS CLAYWORKERS' ASSOCIATION.

Danville, Illinois, January 5 and 6, 1904.

FIRST SESSION.

The first session of the Twenty-sixth annual Convention of the Illinois Clayworkers' Association was called to order in the convention hall of the Plaza Hotel, at Danville, Ill., Tuesday afternoon, January 7, 1904.

President E. M. Heafer: Gentlemen, you will please come to order. As we are rather late assembling, we must prepare ourselves for business. Of course, we want every one to take part in the program, and we will have to act promptly from now on. The first thing on the programme this afternoon is an address of welcome by Mr. S. W. Dixon, who represents Mayor Beard, of the city of Danville:

WELCOME ADDRESS.

Mr. S. W. Dixon, Danville, Ill.—Gentlemen of the Illinois Clayworkers' Association: I deem it a distinction to be permitted today to speak to you briefly these words of welcome, which are commonly expected to find expression from some one on behalf of the city whose pleasure and honor it may be to entertain the clayworkers of the State of Illinois. It is probably your misfortune, gentlemen, that Mayor Beard, because of the delicate condition of his health, has found it impossible to address you on behalf of our beautiful, thriving and prosperous little city. I, myself, have participated in conventions from time to time, where words of welcome have been delivered to us in formal phrase, and it always seemed to me that an address of welcome was somewhat tiresome and almost superfluous. We are very glad you are here, gentlemen. I apprehend you came because, for some reason, you deemed it timely and proper that you should hold your convention for the year 1904 in this place. I am not advised by what words of eloquence, by what cordial handclasps, by what means of solicitation you were induced to be here, but here you are. I presume that Mr. Butterworth, or Mr. Shea, or Mr. Selly, or all of them together, by some means indirectly or directly induced you to come. We are truly glad you are here. We are particularly glad to welcome you because, not only of the importance of the industry which you represent, but particularly because of the character of that industry. We welcome you with particular cordiality and warmth, too, because you represent an industry which those of us who claim some familiarity with the natural resources of Danville and the immediate vicinity, believe is destined to form the very foundation, the firm support of the greater and better Danville of which we dream, and for the acomplishment of which we strive. We welcome you because the industry you represent is peculiarly a labor employing industry. I believe there is no other industry known to man which makes so large an employment of labor in proportion of the value of its annual output, as the brick, tile and allied interests. It is estimated that not less than three-quarters of a million of people depend directly upon the clayworking industries of this country.

President E. M. Heafer, Bloomington, Ill.

We welcome you because of the labor you employ. From what I understand of the nature of your operations, the sweat shop agitation, the child labor laws, and all these acts of legislation, and reformatory measures which look toward the alleviation of morbid and unsatisfactory conditions in certain lines of industry, are not applicable to your industry, as yours is one industry which requires the labor and industry of men.

It has been estimated that the brick produced in the United States of America in one year alone would pave a solid roadway around the globe sixty feet in width. Why the famous highways of the ancient and medieval times pale into indifference in the face of such a conception. We believe, gentlemen, that you are the designers, not only the designers, but the builders and contractors of the greater and better material. Your work wherever it is utilized stands for permanence, for solidity, for durability. It is your product which converts the prairie city, the prairie village, constructed of pine sticks, into a city with its permanent business blocks and its temples of learning and of worship.

Perhaps I ought to speak, and the temptation is strong to speak, in somewhat boastful parlance of the beauties and attractions of the city which you have honored with your presence. However, in looking over your programme, I see that it is an extensive one, the afternoon will certainly be full, and I suspect the time I occupy you will deem nearly wasted. The local representative of your organization will no doubt advise you well concerning the attractions, concerning the institutions, concerning the sights and sounds which may be seen and heard in Danville. We want you to have a good time. We want your meeting to be a profitable one. We are willing that you should remember that "all work and no play makes Jack a dull boy." It is good that you should come together from time to time. No doubt throughout the year you are keen competitors for business, searching for trade, striving strenuously to perfect your operations. It is well that you should come together occasionally, that you should touch hands, that each for himself should understand more thoroughly, not only his limitations, but his strength. We want you to go from here, if possible, and I have no doubt you will, better prepared to carry on the operations of this magnificent industry you represent.

I am advised that the State of Illinois ranks fifth in the States of the Union in the production of clay products. I apprehend that it ought to rank first. We want you, if possible next year to make Illinois rank first in the value and extent of her products of brick, tile, terra cotta, and kindred productions. We are making a few brick here, we are going to make more. I do not know whether we can make them any better than we are now, or not, but we are going to make more of them, are we not, Mr. Butterworth? We want the State of Illinois to stand first in the production of this important material. We are like the merchant transacting business in a town where once I resided. His name was Moses Ikstein. Moses was in the habit of failing at periodical intervals. He invariably settled at 50 cents on the dollar. By and by Moses failed again, and an assignee was placed in charge of his assets. In due course of time the committee who was going through the books, called in Moses, and said, "Well, Mr. Ikstein, we are going to declare a dividend of 40 cents on the dollar." Moses said, "No, you won't. You declare a dividend of fifty cents." "But, Mr. Ikstein," they said, "we cannot do it. You haven't the property." "That is all right," Moses said, "I always pay 50 cents. I will pay the difference out of my own pocket." (Laughter.) We want Illinois to stand first, and if you don't go home and do it yourselves, we are going to do it here in Danville ourselves. I am pleased to have been permitted to speak to you, and I will detain you no longer. (Loud applause.)

President Heafer: In behalf of our Association, I want to express a hearty appreciation of the kindly and hearty words of welcome that have been spoken to us. After having received such a welcome, we will certainly all of us feel at home, and I assure you, Mr. Dixon, that we will conduct ourselves so that those who extended the invitation to us to come here will not regret having extended the invitation, and those who have welcomed us will not regret their welcome.

Secretary Stoll: The first regular order of business is the President's Annual Address.

PRESIDENT HEAFER'S ADDRESS.

Gentlemen of the Illinois Clayworkers' Association Convention:

It is many years since the clayworkers of this state first organized. Perhaps it was in the year of 1878; at any rate, about that time. I was a charter member, and was, I think, elected secretary or at least something. The first meeting was held at Springfield. Since that time, I have attended but two meetings, one at Ottawa and one at Bloomington. However, I have not been unmindful of the gatherings, for it has afforded me great pleasure, as well as much profit, these many years, to read the proceedings of each and every convention held. Great strides of progress have been effected, both in the manufacture of brick and tile here and elsewhere since the original convention. Then there was scarcely a successful brick machine plant in the state. Gard, the pioneer brickmaker by machine, of Chicago, had just broken up or was in the process of commercial dissolution. Quite different is it now, when steam plants for brick manufacture are found everywhere, especially where this article is produced on a large scale. Surely it appears that the machine method is rapidly supplanting the hand method. Reverting back to those primitive days of tile production, I can see my cheap horse at the end of the sweep that gave motion to the old Penfield machine, that delivered flat bottom tile on boards. It was necessary to "chew the food" for this machine, as it was hardly capable of masticating and digesting the rough, coarse clay. Nevertheless, considering the times, this machine was a meritorious one.

It would be impossible in this paper to relate the different progressive steps that have been taken; it would be impossible and wearisome to the auditor to describe present results which are so generally known, but suffice it to state that, while we have witnessed in the last two decades a marvelous increased demand for brick and tile, "ways and means" have been provided to satisfy such demand.

Perhaps, not in the history of the country were the clayworkers in general so prosperous as in the year just ended. But prosperity is not an endless chain. No doubt, we have reached the summit and are starting down the declivity of adversity. Banks are breaking up; large institutions are suspending operations; thousands of men are thrown out of employment and, if adversity is not in sight, surely the "signs of the times" indicate that its advent is not far off. This may be pessimism, but pessimism is often preferable to optimism, for the former tends to be accurate, while the latter tends to be popular.

Secretary G. C. Stoll, Bucyrus, O.

It will probably be necessary and advisable for manufacturers to keep close to shore.

As it is not the intention of the president to weary you with a long address, will close by suggesting some attributes of paternalism that might possibly to advantage be assumed by this society. We meet from year to year to discuss plans of production but very little attention seems to be given to matters of distribution. The first convention that was held, had its birth during the good old days of Grangerism and many of the members feared the impression might prevail among the farmers that the object of the association was to raise prices, but great care was exercised to disabuse their minds of any such supposition. At that meeting an attempt was made to have a lien law for themselves passed; a committee was appointed to wait on the legislature, but the idea "died a bornin." In this state, there is still no law of that character, while I believe there is in Indiana and some other states.

The freight rates on brick and tile are very high to the great majority of manufacturers. Of course, a few have special rates, but such favors extended to the few confer no benefits upon the many of this organization. Where a few of our members enjoy such benefits the great majority of this association have to be taxed so much more. We are "Jones," and "Jones, he pays the freight." We who pay the full tariff, know by comparison with the open rates on other articles that the charges assessed upon us are excessive, but, if we pay excessively compared with the open rate, how insufferable must be our loss when attempting to cope with our competitors who enjoy secret rates and rebates. The railroad companies contend that they treat all alike. Let's see: The freight on brick from Bloomington to Chicago is $6.78 per hundred pounds. Our brick weigh, generally, four and one-half pounds, which would make a freight rate of $3.03 per thousand, yet I understand they ship brick from Chicago to Bloomington, selling price of $5.00 per M, Bloomington delivery. If there were no secret rates or rebates, the rest of us could surely obtain better rates than those prevailing at present. If all are treated alike, why is it that the railroad companies have just notified thousands of rebate clerks that their services are no longer needed? Is it not likely that their services will again be needed long before the year is ended? If this organization wishes to benefit further its membership, it could, perhaps, guard its members against excessive rates, or at least protect its members who pay a full rate from the ruinous results that proceed from an attempt to compete with him who is a beneficiary of a railroad company's unjust discrimination.

The railroad companies are not nearly so much to blame as the company's beneficiary, for the former generally makes the concession under duress. The penalty for such wrongful act should be applicable to him who solicits and obtains such favors, not to the transportation company. If this organization, alone or in connection with other organizations, could succeed in abolishing secret rates and rebates, it would, while hurting, possibly, a few of its members, confer a marvelous blessing upon the great majority of its members.

I desire to thank this association for conferring this honor upon me and I wish to express my appreciation of the services rendered by my associate officers. (Applause.)

Secretary Stoll: Before the first paper on the program is read, I want to make a motion. You all of you probably take one or two of the trade papers, some of you take all three of them. We have a stenographer, Miss Wallace, here with us today to make a full report of the proceedings of this meeting. Last year the Association voted to pay Miss Wallace for this work, and give the same report to *Brick and Clay Record*, as she made for Mr. Randall for THE CLAY-WORKER. Now, inasmuch as some of you do not take all the papers, and so may miss this report, I move that hereafter the Association pay Miss Wallace out of its treasury $35 each year for making this report and give a copy to each of the three papers.

The motion was duly seconded and carried.

Secretary Stoll: The first paper is "Necessary Sizes of Drain Tile," by Mr. L. R. Whitney, of Terre Haute, but he informs me that part of his thunder has not arrived. Mr. Cowgill is to bring it with him, and the train is late, so I suggest that we take up the next, which is a paper entitled "Civic Improvement," by D. H. Jansen, C. E., of Pekin, Ill.

CIVIC IMPROVEMENTS.

By D. H. Jansen, C. E., Pekin, Ill.

The subject given me by our secretary is so large and comprehensive that it is impossible to discuss more than one or two subjects, and so I will confine myself to a few remarks on city pavements. It is not my purpose here to give a detail of their construction, but simply to touch on those points that have appealed to me in the past year as needing discussion in a meeting of this kind.

City pavements in Illinois can today be paid for by either general or special taxation, or special assessment. The method used almost entirely at the present time is a special taxation of contiguous property and this method is generally satisfactory. One vital reason for this is the fact that the property owners affected take an interest in the quality of the materials and the manner of construction of the work and can compel good work under the special assessment laws, while under the general taxation system, their assessment is so small that it is left entirely to public officials.

Our special assessment law has been amended so often that it is open to criticism. Every time you want to use it, you have to get a Philadelphia lawyer to straighten it out, and then you may have to retain the services of another attorney to straighten his work. The last amendment, made at the last session of the legislature, amends Section 4 of this Act to read as follows: "When any such city, town or village shall by ordinance provide for the making of any local improvement, it shall, by the same ordinance, prescribe whether the same shall be made by special assessment, or by special taxation of contiguous property, or general taxation, or both. But in cities, towns or villages having a population of less than fifty thousand and more than twenty thousand, ascertained as aforesaid, no ordinance for making any local improvement to be paid by special assessment or by special taxation of contiguous property, shall be adopted, unless the owners of one-half of the property abutting on the line of the proposed improvement shall petition for the same."

This amendment is certainly a freak and ought to be placed in a museum so future generations can read it and ponder over the justice of law. Note the curiosity: Board of Local Improvement in cities over 50,000 and under 20,000 population have the privilege of creating improvements for the public, but those in cities from 20,000 to 50,000 population have not. What folly to make a law that is good for one person and bad for another. If Board of Local Improvement in cities over 50,000 and under 20,000 are capable of creating improvements, why are not the same authorities in other cities? I personally believe that all boards of local improvement should be given the power to create schemes for public improvement for three reasons:

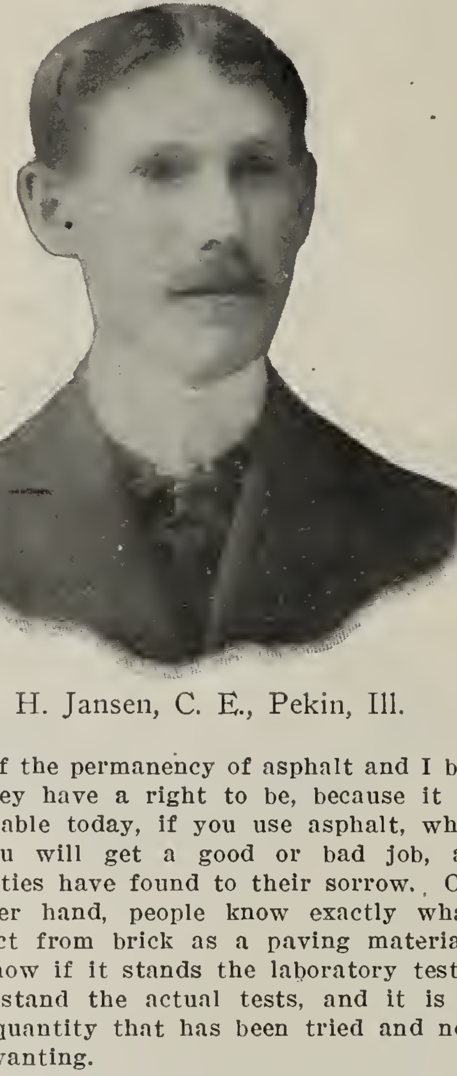
First—The public are safeguarded from excessive or unnecessary improvements by the city councils, who are required to pass all ordinances for the same.

Second—I do not believe the general public are as capable of judging the nature and economy of an improvement as are the officials, who devote their time and energy to a study of these matters. Petitions are not generally promoted by the property owners, but by some one in the employ of a paving concern and, naturally, the petition, is made for the benefit of that concern and not for the public good.

Third—It has been found that, unless some official takes up the matter of improvements and hustles it along, there is little or nothing done, even where absolutely necessary. It is a matter of history that all great works have been promoted by governments and that the people of their own accord do practically nothing.

There is one other point I wish to emphasize in regard to this law, and that is the needless amount of red tape, time and money it takes to carry out a scheme for improvement. I believe that we ought to exert every influence to have this law changed so that in all cities, boards of local improvement not only have the power to create improvements, but can do so in a reasonable time, at a reasonable expense, and feel absolutely certain that they are abiding by the law.

I would now like to take up a little of your time in discussing brick and asphalt, the two materials most prominent today in the public eye in Illinois. Comparing these materials, we find that brick excels asphalt in cheapness of construction, durability and good foothold. It is superior to asphalt in ease of traction in hot and slippery weather, and inferior in cleaning. It is less expensive to maintain, especially in small cities, where repair plants for asphalt are not maintained. Studying these facts, we wonder why some people select one, and some another pavement. We must admit that, to the public eye, a well constructed asphalt pavement looks more pleasing than a pavement built of brick, and I believe that this fact alone decides in favor of asphalt in a majority of cases where asphalt is used. Then, too, there is something seductive in the five-year guarantee the asphalt people are willing to give, but if we look into the cause of this guarantee demanded of the asphalt people, isn't it a fact that people demand it because they are afraid of the permanency of asphalt and I believe they have a right to be, because it is questionable today, if you use asphalt, whether you will get a good or bad job, as many cities have found to their sorrow. On the other hand, people know exactly what to expect from brick as a paving material. They know if it stands the laboratory tests, it will stand the actual tests, and it is a known quantity that has been tried and not found wanting.



D. H. Jansen, C. E., Pekin, Ill.

The question of maintenance of an asphalt pavement also decides many officials in favor of brick. We know that it is easy to repair brick pavements, because it can be done by local men, but when we come to repairing asphalt streets, we find that we must get a railroad repair plant, get experts to do it, and that it costs an excessive amount of money. Do you wonder, then, that when I wrote to the city engineers of twelve representative cities in Illinois, as to the amount of brick and asphalt pavement laid up to the present time, I found in summing up the totals for all replies received, that there are 138 miles of brick pavement and 16 miles of asphalt pavement, and I believe this represents the opinion of the public today as to the merits of the two pavements. If the public want a luxurious pavement, give them asphalt and, if they want an economical pavement, give them brick.

Now I will endeavor to discuss a few features of brick pavements, and naturally the first subject is specifications. The specifications adopted by the N. B. M. A. are the best that I have seen up to date. One feature of these specifications is still under fire, and that is the question of an absorption test for paving brick. Engineers are divided on this point and you still find that most paving brick are subjected to this test. I do not believe it is necessary, as I think the Jones-Talbot rattler shows all the defects that the absorption test does, and some not shown by the absorption test. We know that either will detect a soft brick, that a good brick will stand the rattler, but may not stand a two per cent. absorption test, and we further know that the rattler will detect an over burned brick, but the absorption test will not. The rattler shows definitely the qualities of the different bricks, but the absorption test shows little if any difference in the brick that is burned just right and the brick that is overburned. Why not, then, do away with the absorption test? Ought we not in fairness to the public, the contractors and ourselves, make our specifications as simple and concise as possible and do away entirely with everything unnecessary.

There is one feature in the construction of pavements that needs particular attention and care, and that is the sub-grade; it must be thoroughly drained and must be well compacted, and ordinary methods often fail to accomplish the last result. Take a business street as an example; the street has probably been dug up to receive water and gas pipes and sewers and the dirt roughly tamped back or probably not tamped at all. It is then traveled over a few years and the people want a pavement. The travel has made a crust two or three feet thick over the trench, and one foot of this is probably taken off to get to sub-grade for the pavement, and there are no visible signs of the trench; the street is rolled lengthwise and the pavement constructed, and in a year we have a sag; the roller has failed to accomplish expected results. In order to remedy this we can adopt any of the following methods: Roll the street crosswise with the roller; locate the trenches and tamp by hand; or get a roller which is divided into one-foot sections and give them enough vertical play so each can act separately on the ground it rolls. I believe bad sub-grades are the cause of most failures of brick pavements, and that we must obviate it as much as possible.

The question of using concrete for a foundation is one that should be governed entirely by local conditions. On sandy soils, a two course brick pavement will stand as well as concrete and brick, and on residence streets six inches of broken stone or gravel give a very satisfactory foundation; in some cities with sandy soils, one course of brick on a few inches of cinders have given good results. If concrete is used, make it from Portland cement, sand and gravel, where gravel can be obtained on an equal basis with broken stone. The present price of Portland cement makes a four inch concrete foundation with Portland cement about equal in cost to a foundation composed six inches of concrete with natural cement, and it is far preferable. Gravel should be used, as it contains about 35 per cent. voids as compared with 45 per cent. voids in broken stone, and, therefore, takes less mortar and is cheaper.

In conclusion, I wish to say that the thing that is worrying engineers today in the matter of brick pavements, is not the question of getting good brick, as we have plenty of them in Illinois, but rather the question of construction. Would it not be a good idea, if manufacturers of paving brick would try to guard the engineer a little and at the same time protect themselves by refusing to sell brick to contractors who do poor work, and who consequently injure every department connected with the business. Give us good construction of brick pavements and I prophesy that brickmakers can continue to exult for a long time in the fact that their product still holds the lead. (Applause.)

Prsident Heafer: The paper is now open for discussion. We would like to hear from Mr. Shea.

Mr. J. G. Shea, Danville, Ill.: I do not know that I could improve on that paper any. It is a fine paper all the way through. There is one point he touched I would like to speak on, and that is, in filling these trenches in the streets. They are tearing up streets continually in repairing, and nearly all the bad places in our streets in recent years have been caused by these trenches being dug, and the pavement not being properly laid afterward. I find the proper thing to do is to take the dirt out, and fill up with gravel. There is no depression then in the pavement when it is laid again. It would be a very good thing for the city authorities to compel the workmen to fill the trenches with gravel.

Dr. A. L. Converse, Springfield: I am very much pleased with the paper, and the only way I could improve on it would be to give it about twice the circulation it will get. (Laughter.) That is no reflection on our trade papers, but I mean that the thought and sentiments of that paper ought to be in the hands of every engineer. I have never met the young man, but I will put him down as an honest engineer, and I don't think they all are. If we can succeed by some process in getting good foundations and good fillers, the brick men will have little to fear in regard to brick pavements. I am satisfied that even a comparatively poor brick (the better the brick, the better the pavement always), but a comparatively poor brick will make a good pavement if properly laid, and an A No. 1 brick unless properly laid will never make a good pavement. The great trouble with the majority of pavements is the street improvements which take place after, and sometimes before, the pavement is laid. I believe a good concrete foundation is the best foundation. I do not believe it possible to make a first-class foundation in many of our Illinois towns without having something that will be self-supporting and solid. I think the author made a true statement in regard to foundations. I can see plainly that some of the smaller towns where the traffic is light can get along with a light foundation. The other thought he brought forth is one that I have been observing to some extent ever since I have been selling brick, but I do not know just how far to go. That is, in regard to revising or raising prices on men I know will do inferior work. I generally do the best I can toward finding out who will do good work, or work that is satisfactory to the city. I am surprised that some brickmakers and contractors seem to think when a job is off their hands, that is all there is to it. The National Brick Manufacturers' Association method of putting down brick pavement is a decided improvement over what it used to be, and I do hope that all the engineers will familiarize themselves with what constitutes a good brick pavement. There have been a good many converts. Now, about the filler. I want to tell you what I heard an engineer say. He was examining a piece of brick pavement, and he said, "It seems to me that the mortar they are putting between the brick has not got enough hair in it." (Laughter.) Such a thing could not be told on many engineers, but I have seen some engineers who had charge of some important work that did not know much more about it than that. I was talking with a contractor about some work he was doing some time ago when he said, "I have tried my level best to do good work and make it satisfactory. I am about half through and I have been so annoyed by little trifling things, and asked to do things that are not right, that I am about discouraged, I am almost disposed to let the engineer do what he wants to." Mr. Jansen draws a comparison between asphalt and brick. I think the asphalt company is pretty safe in giving a guarantee for five years. I think I have never seen an asphalt pavement that did not begin to deteriorate in seven years, and the worst pavements I have ever seen were made of asphalt. I was in the city of Albany and I saw a street there that I would be afraid to drive over. And the same thing is true of Buffalo. Asphalt makes a beautiful pavement if well put down, but an asphalt pavement put down that will really compare with brick costs about three times as much. I am satisfied that it does not compare with brick for durability. Some of the larger cities that do not expect their pavements to last very long, can put asphalt streets down on their residence streets and they will answer fairly well, but for the masses there is nothing that can compare with brick that we make, and I don't believe there ever will. (Applause.)

Dr. A. L. Converse, Springfield, Ill.

President Heafer: We would like to hear from Mr. W. S. Purington.

W. S. Purington, Galesburg: This matter has been pretty well discussed, and we are all of the same opinion. There is one point, however, that none of them seem to have touched on, and that is the cement filler. Mr. Jansen did not say anything about that. I do not know whether he recommends it, but it is the thing to use. The suggestion was made among some brickmakers in a trip I made recently that we all agreed to, and that was to sell our brick much cheaper provided they would use a cement filler, and I think we should every one of us, insist on specifications being drawn up providing for the use of a cement filler. Speaking of asphalt. There are only a few places in this country where asphalt has proved anything like successful. One is Washington, D. C. I think the climate there is nearer being uniform than most any other place. They do not have extreme weather either in summer or winter. Last year there was a contract let in Duluth in which there were three or four different kinds of pavement to be bid on. There was a block of asphalt put down. It had been closed up about two weeks. The asphalt people were a little bit afraid of getting their mixture wrong for that climate. The night before the letting, some one along the street, let a horse loose on this piece of pavement and he ploughed right through it. It was warm weather, and the asphalt stuck to the horse's feet. Of course, that killed the asphalt pavement, and I do not think they will try to put down any asphalt pavements in Duluth. They are not able to get a mixture that will stand the two extremes of heat in summer and severe cold in winter.

A member: I should like to ask Mr. Purington how he would recommend the application of the cement filler.

Mr. Purington: I do not know. I have never seen it tried, but I think Mr. Grimes and Mr. Blair say they will recommend a single course with a cement filler in preference to a concrete base and a sand filler. They think it would be about the same expense. Of course, the expense would be greater than with a concrete base. The streets I saw in Terre Haute are as firm and beautiful as any asphalt street. They recommend a square corner brick with a cement filler, and I think it is preferred to a rounded edge of three-eighths radius, or even less. I think a cement filler with a single course will work all right, and I am going to try it at Galesburg, and I think it will stand up. I know our strets there with the brick laid on three inches of sand as a foundation are not a success. They have settled in spots all over.

Mr. T. A. Randall, Indianapolis: Just a word in regard to Dr. Converse's remarks. He thinks this paper of Mr. Jansen's is deserving of a wider circulation than it will get regardless of the wide circulation of our trade journals. Every city engineer in the country should read it very carefully. It is a keen, well written paper, and I want to ask the permission of the Association to publish this paper in pamphlet form, after it is published in the trade papers. I think it is well worthy of reproduction, in that way so that those who want can put it in the hands of the engineers of their territory. If there is no objection I shall take silence for consent and have the paper put in pamphlet form.

Dr. Converse: Before publication in that shape, I should be very glad to have Mr. Jansen say something about fillers.

Mr. Jansen: Before Mr. Randall has this paper printed in pamphlet form, I would like to revise it. There are some things in it I should like to state more clearly.

Mr. Purington: Would you recommend cement fillers?

Mr. Jansen: Yes, sir.

President Heafer: If there is no objection to Mr. Randall's suggestion, I think it would be proper to give him the permission he asks for. All in favor of the suggestion say "I," contrary, "No." Carried.

Mr. J. G. Shea: While as a matter of fact the streets are very fine in Terre Haute and in all cities where the brick are put down and the work properly done, where they have as good a natural foundation as they have there, but that will not hold good in all cities in the West. It has been disputed by engineers that the cement filler is a good thing. Where the grade is steep they prefer a sand filler. Now as to the foundation, the concrete foundation is the very best foundation of all, and it has been proven to us since the time the first brick street was laid. The first brick pavements were laid on planks in West Virginia, other pavements have been laid on sand, but it has been decided that the concrete foundation was in all cases the best. We have been using two course work in this city and we have very good streets, and as for the cities of this State two course work is very satisfactory. On them the concrete would be fully as good, maybe better, because we have a good natural foundation. I noticed by one of the Chicago daily papers that a committee had been appointed by the city council to make a trip and report on the best method of laying streets, and they reported on the city of Buffalo, N. Y., where they have the most asphalt streets of any city in the United States—240 miles, and they did not recommend the concrete foundation. They said it was not giving satisfaction in Buffalo, that it did not stand the frost. Now, that is the report published in the Chicago papers, and I presume some of you read it. I am not familiar with it myself, but I notice in the cities where the foundation is natural, that it is very satisfactory. The question is, is it good everywhere. While the cement filler has been used a good deal in a great many cities, it has given satisfaction where the grade was flat, but with a steep grade, the sand filler would be better. The concrete filler in this city would cost 20 cents a yard. The contractor wants to make something out of it of course. This question of foundation and filler is of course one for the engineers and brickmakers to settle.

Secretary Stoll: We will have to make a shift in our program again, as the next number is a paper by Mr. Blair. I have a telegram from him saying that his train is late, so we will pass on to the next, a paper by Mr. D. C. Haeger, on "The Beginner."

THE BEGINNER.

By D. C. Haeger, Dundee, Ill.

Gentlemen of the Convention:

Why the secretary should assign such an abstract subject to me, one who is hardly a beginner, seems, indeed, very strange, unless he wished to have the meager knowledge of a beginner displayed. Ordinarily, when one prepares to start upon life's journey, and is leaving the high school for the greater school of life, he is assigned a subject dealing with matters that even the old gray heads have not been able to work out to their own complete satisfaction. It would be far better, were a subject like this given to one who, after a long term of years in the brick business, is ready to retire, and finds that he is only a beginner in this great study of clay, and what can be done with it. The young brickmaker, not realizing the importance of his industry, is too apt to consider it as one that is easily grasped, only to find after hard knocks and many trials that such is not the case. And so, in treating this subject, let us consider the trials and the experiences of a beginner, for it is these that teach him the most and best about the industry that he is striving to carry on. Although in the business only a few years, yet in that time this beginner has had experiences, the relating of which would take up more time than is allowed for the reading of this paper.

It was quite a pastime, when the two yards were under an older and wiser management, to saunter around and watch the brick and tile being made. Although possibly old methods were being used, yet the would-be beginner knew the balance was on the right side of the page, because of the prosperity that was being enjoyed. There were then many ways in which labor could have been saved, but these were not noticed until the management was taken out of the older hands and dropped upon the shoulders of the younger generation. Then all things changed, and, whereas, formerly, ten minutes at the yard was sufficient for the kid to see everything he had any interest in, the time was now limited, and one could not get round to see everything he would like to see.

It was the fortune of this beginner to step into the management of a good brick and tile business, and the misfortune to lack any previous knowledge of the practical side of the business; consequently, there was a great deal to learn and to learn in the best way.

Where before everything seemed to work without the noticed attention of the manager, there were now numberless details to look after, plans to be made ahead, and work to be arranged for. About the first thing learned was that labor was not the easiest thing to manage. Starting with the foreman, I will say that one of our yards had had the same man in charge for about twenty years. A good foreman in some respects, and a very good burner, yet he belonged to the old school where things were done differently than they are now in these times of close competition. On account of his situation, he had become alderman of the village, and it was the brickyard vote that carried him to office at each successive election. The more hands employed, the more votes it meant for him, and consequently the payroll was high on that yard. The new management, not being onto the political ropes, was endeavoring to keep down expenses, and show that they could make that yard pay, and, consequently, trouble arose. That man now is out of the position, the same being filled by a young man of 28 years of age, of mechanical turn of mind, and one who has been brought up on the yard.

James Van Inwagen, Jr., Momence, Ill.

In the two years, 1901 and 1902, we had considerable trouble with our labor, most of which could have been avoided, had prompt measures been enforced. After the whole gang of men have quit their work and are standing in front of your office, telling you what they want, etc., you will find it is not as easy to talk to them as it would be were they on the yard. Tied up with contracts at good prices, we always gave in in a certain way, finding that if we only advanced the wages a small fraction of what the men asked they would decide to go back to work. To show you how some of our men figure, will say that when we reduced the amount of piece work to be done for a certain sum, which has remained the same for the last three years, the men did only the amount of reduced work, and quit for the day. The result was that our output was lowered, while they were getting exactly the same wages as they had received for the last three years. We are now running a new machine plant and require fewer men, and when, on May 1st, 1903, at which time we had our last labor trouble, the men struck for nine hours work, etc., checks in full were given to each of them, and we hired new men at the old wages. We endeavor to be fair with the men, will gladly at any time talk over questions about their work, and in every way work with them on the same level. Employers are too often inclined to think that labor owes all to them, whereas, in fact, we cannot get along without each other. Where the best of feeling exists between the men and the management, and the men know that they are being treated fairly, there should be no serious labor troubles to adjust on the small yards.

Some of the other experiences we have had have been the proper mixing of our clays, the handling of same cheaply, the burning of same, and questions of this kind which arise naturally on all yards.

We have three clays to mix, all being in different places, two of them being covered with gravel to the depth of twenty-five feet. This gravel, however, is hauled away ahead of us and used for grading purposes. This winter we tested the clay land off which we have already taken twenty feet, and found that same goes down to the depth of thirty feet and possibly further, our boring iron not being long enough to reach further. The problem of thoroughly mixing these three clays for stiff mud brick has not been fully solved and as yet we have not been able to mix as well as we did with the old-fashioned tempering wheel. However, we are putting in a track and car system and will put the three kinds of clay into one car at the pit, dump into the granulator, then to the pugmill, via the disintegrator, then to the machine, and we hope, thereby, to mix the clays sufficiently to make an evenly colored brick.

Last year we placed the stiff mud brick in sheds, and found that they would not dry fast enough to keep the setter busy. The consequence was that some of the brick would be set too wet and, after burning, we would find a great many bats. We are now building a dryer and trust that this trouble will cease when we are able to set nothing but bone dry brick. We had some trouble when we burned our first kilns of stiff mud brick but the burners soon leearned how to handle them. Our kilns at the brick plant are the old-fashioned scoved up-draft, holding 300 M brick, and in which we get very good burns. It was simply a matter of experimenting until we had learned how to fire the brick.

In regard to experimenting, in general, we have found that it certainly pays us well, although, possibly, not by doing it personally but by suggesting and letting the foreman work the experiment out for his own benefit. The smaller plants are too apt to get into the routine way of doing things, and the older hands soon begin to believe that there is no other way but their way. When a man gets this idea into his head we change him, for we want men around the work who have their eyes open to new ideas and are willing to try them. We had an experience of this kind with our first kiln of stiff mud brick at our new machine plant, with the result that the kiln was choked, while the second was half soft, because the brick were watersmoked too dry. Certain things were done, no matter how the brick were standing the heat, simply because this rule had been followed while burning soft mud brick. The error of doing this was soon evident to the new foreman, and he profited by the experiment, as by the end of the season the burns were very satisfactory.

But a great many of the less important details can be taken care of by a good foreman, if he is not pinned down but made to feel responsible for everything connected with the proper running of the yard. At certain intervals we figure out with the foreman what the different items are costing, and endeavor to interest them in seeing how much they can reduce them. The result has been that we have saved the labor of fifteen to eighteen men at one yard, and have accomplished one-third more work at the other with the same gang.

We have often heard it remarked that the money is made on the yard and not in the office. It is true, to a certain extent, yet the office work and the financial end must be well carried on or there will be no need of any manufactured article.

The first lessons this beginner learned were to take a couple of brick in a satchel, go out to the trade and get turned down, and that not always in a polite manner. We have found it to be a very good thing for the manager of a brick and tile business to call on his customers, to learn to know them and how to handle them. After meeting your trade, their letters are plainer to you, and misunderstandings will seldom arise. Incidentally we learned the prices of our competitors and were able to adjust our prices accordingly. In the office we have used the handiest methods and have systematized the work to a great extent. Correspondence is promptly taken care of, bills are sent out the same day that the goods are shipped, and in every way we have endeavored to have the trade taken care of.

We have found out that, at times, experimenting costs money, and that it is cheaper to visit at other yards and get the benefits of the experience of others in our line. When purchasing machinery, dryers, and so forth, we have been greatly helped by the advice of other brick men, who, in every instance, have been more than glad to impart knowledge that probably cost them something to gain. Again, we have been greatly helped by the reading of clay journals, which are invaluable to the beginner.

In conclusion, we will say that among all the things we have learned is the fact that although some seem to think the mud business of minor importance, yet we have come to consider it to be the opposite. The possibilities of a young man making a good living in this line are good, and with the large fields we have before us, there should be many beginners. (Applause.)

General Discussion.

President Heafer: This paper is open for discussion. The ground seems to have been well covered by Mr. Haeger, and as Mr. Whitney's "thunder" seems to have arrived, we will hear his paper.

Mr. L. R. Whitney, Terre Haute, Ind.: Fellow Clayworkers of the State of Illinois, it does me good and gives me great pleasure to look into your faces and become acquainted with you. As you will see by the program, I am a Hoosier from across the line, although I live pretty close to the border. Thirty-three miles south of here is the little village of Hillsdale, where we have one of our plants, and fifty-five miles south is the city of Terre Haute, where we have another plant, and if any of you want to swing around the circle in going home, we will be very glad to have you visit our plants. We also have a plant in connection, or on the same yard, with the Marion Brick Company, at Marion, Indiana. I have been told that some of the brickmakers are going over to Marion to investigate a new system of drying which they are installing there. If such is the case I desire to give you a cordial invitation to visit our plant there. Not being much of a talker myself, I brought with me a tile which briefly tells the story better than I could if I proclaimed it from the housetop. Here I have one of our 30-inch tile. Three years ago at your convention held at Springfield, Mr. Cowgill, the President of our Company, mentioned the fact that we were attempting the manufacture of a 30-inch drain tile. It was looked upon as really absurd, but here we are, and here is the 30-inch tile.

My subject was postponed, and this (holding up a couple of pieces of tile) is what I was waiting for. I do not know which is which, but Mr. Cowgill brought these tile from the Holy Land and the one fact I wanted to call your attention to, is that these tile are not vitrified. This piece is burned to semi-vitrification. It is not slag from the kiln, but really a piece of tile broken from a whole tile because Mr. Cowgill did not want to bring the whole tile with him from Old Athens. It was brought from Athens, Greece. Mr. Cowgill is here and knows more about it than I do, and I will ask him to tell you about these tile.

L. R. Whitney, Terre Haute, Ind.

Mr. S. C. Cowgill, Summittville, Ind.: I was traveling through Asia and the old country three years ago. I had often been asked the question by my customers how long my tile would last, and while I was in Athens, they were excavating from some of the houses which they told me had been destroyed two or three hundred years before Christ, and they threw out a 4-inch tile, about fourteen inches long, larger at one end than at the other, so that one end slipped into the other, instead of having a collar. It was a little over four inches at the larger end. I was very anxious to get one of those tile. They have guards all around to keep tourists from picking anything up, so I could not pick up the whole tile, but it was easy to break off a piece and after a while come back and pick it up and put it in my pocket. You can call it stealing or what you like, but I got the piece of tile and here it is. (Laughter.)

A member: Kleptomania is a more polite phrase. (Laughter.)

Mr. Cowgill: That piece of tile must have been made at least two or three hundred years before Christ. Here is another piece which I obtained from a drain which leads from Solomon's Pool to the city of Bethlehem, which was built by Herod the Great, about thirty-seven years before Christ. The drain was under ground and appeared to me to be all stopped up. They told me the drain was under there, and I crawled to it and it appeared to have been laid with 12-inch tile. As I said it was all stopped up, but still I wanted a piece of tile that had been in the ground 2,000 years so I could tell my customers that tile would last 2,000 years. (Applause.)

Mr. Whitney: I want to say that they do not show anything like as good quality as this 30-inch tile here. They may have lasted 2,000 years, and have been made way back in Herod's time, but I don't believe Old Herod ever saw anything like that (referring to 30-inch tile). (Laughter.) Guess it will be as well to read what I have written.

NECESSARY SIZES OF DRAIN TILE.

By L. R. Whitney, Terre Haute, Ind.

Gentlemen of the Convention:

Some few weeks ago I received a request from your worthy secretary, Mr. G. C. Stoll, that I accept a place on your program and prepare a paper on the "Size of Drain Tile." This subject as set forth in the letter making the request, was unqualified and without modification. He did not request that I give a history of the evolution of drain tile with regard to size, and trace it from old Damascus down to the present, nor can I believe that Mr. Stoll expected me to assume the presumptuous position of advocating any certain set of rules and regulations that would govern the exact size of drain tile to be used for each individual drain, without having due regard for the general lay of the land, character of the soil and the grade to be obtained; yet, there are certain basic principles common to all drains, and figures in tabulated form, based on actual experience, may be used as excellent comparative data by the expert in drainage, as well as the novice in the art.

In tracing drain tile in its evolution, we find it among the ruins of ancient Babylon and Damascus, the Romans made use of it in a limited way, but the warlike tendency of that nation dwarfed the pursuit of agriculture, hence the necessity did not exist for the development of that art. Small drain tile were used in England back in the days of Prince John and Oliver Cromwell, and in the year 1790 we find the Royal Agricultural Society recognizing the value of the work of one, Joseph Elkington, an ignorant Warwick county farmer, for his peculiar and successful method of draining wet soils in his own county, and in the year 1795 we find that same progressive Society recommending that parliament vote Elkington one thousand pounds sterling in recognition of his great service to his country in reclaiming wet soils.

The heather lands of Scotland were not exempt from artificial drainage in a crude and limited way, by means of burned earthenware, and all praise be to the sturdy Scotchman, John Johnston, who introduced drain tile into this country and who, about the year 1830, imported a pattern from Scotland and made the first crude and diminutive two-inch tile with which he drained his farm, located near Seneca Lake, N. Y.

Encouraged by his success, he imported the first tile machine to this country in the year 1840. Thus, within the span of life of some of those who are attending this convention, we have the first foot of burned drain tile introduced and put into practical use in the United States.

The light could not be hidden under a bushel, and, like a searchlight on the hilltop, the beacon shone westward until Pennsylvania, Ohio, Indiana and the great fertile plains of Illinois and the middle west caught the spirit and have magnified it a thousand fold.

We are living in a rapid and progressive age. For comparison, side by side, set the John Bull locomotive and the magnificent Atlantic type of today; the Chinese blunderbuss, and the guns of our modern coast defense; the reaping hook has given way to the modern self-binder, while the wooden mold-board has been displaced by the steam gang-plow with umbrella attachment; and drain tile, yes, drain tile, has kept pace with the procession, and, as an illustration, we would point to our display or exhibit in the agricultural hall of the University of Illinois, at Urbana, where may be seen the diminutive tile of the John Johnston variety, while, side by side, are shown the scale in an ascending series, ranging from three-inch to thirty-inch in size, thus showing at a glance the progress made in this line, the great hand maiden of agriculture.

Until very recent years, farmers of the great middle west, or any other section of the country for that matter, could not secure drain tile larger than ten-inch or twelve inch, and the question, "What can I do with my old open ditch?" was for many years answered only by the echo and the very howling winds seemed to whisper "e-v-e-r-m-o-r-e," but the demand brought forth extra exertion and tilemakers began to feel their way cautiously into the shadowy unknown, first to attempt and then to attain, or first a fourteen-inch then on up the scale inch by inch until thirty-inch are successfully made, and the end is not yet, so it is possible today to secure miles and miles of farm drain tile, even as large as thirty-inch, and the old open ditch, fringed with its growth of willows and horse weeds, its snakelike form and attendant point-rows, is fast disappearing before the solid phalanx of drain tile turned out from the shale banks along the Wabash.

Regarding the size of tile for each individual drain, as said at the outset of this article, it is not possible to show this exactly, by any tabulated list of figures, yet tables are published by parties who attempt to show it by estimating the number of gallons of water that fall upon an acre of land per hour, even reducing it down to the minute, then assuming that, not to exceed 50 to 75 per cent of the water reaches the tile within the same given time, they deduce a table of figures purporting to show that certain sizes of tile are required to carry off the excess water.

This manner of reasoning reminds me of the question in our old geographies, which possibly many of you remember: "Give three proofs that the earth is round?" Answer: First, "it revolves upon its axis." This is quite true, but the average urchin fails to grasp the idea. Second, "it casts a circular shadow on the moon at the time of an eclipse of that body." Again this is true, but the student reasons only in the abstract and traces of uncertainty are still present. Third, "General Grant traveled round it." At last, light dawns upon the pupil; he reasons in the concrete and grasps the idea in all of its practicability. Ask him in review to give "three proofs that the earth is round," and the very first answer will be, "General Grant traveled round it," while the two other reasons are given laboriously or are forgotten altogether.

Gallons, pints and gills of water falling on an acre of land within a given time and the deductive form of reasoning from that to the necessary size of drain tile required to drain it, is all right for those who understand it, but it is too much like firing a blunderbuss entirely too scattering, too far-fetched.

Say to the average farmer that a certain size of tile laid at a certain gradient will drain an approximate number of acres. Cite him to a score of county or drainage districts jobs within a radius of fifty miles, where it has proven to be a success, and you at once have him interested, since you are reasoning with him in the concrete and not abstractly.

We, therefore, publish a table in our illustrated catalogue which gives approximately the number of acres that can be drained by different sizes of tile when laid at different grades, and, while we do not claim that the figures are infallible, yet they were gotten up by one of the most competent drainage engineers in the state of Indiana, and, if theoretically wrong, they are practically correct, since they have been put to practical test in hundreds of cases in Indiana, Ohio and Illinois, have been proven to be a success and "the proof of the pudding is in the eating thereof."

Acres Drained by Different Sizes.

Tile Laid at Different Grades.

GRADE PER 100 FT.	SIZE OF TILE													
	4″	5″	6″	7″	8″	10″	12″	14″	15″	16″	18″	20″	24″	30″
.05	13	23	36	53	74	129	204	299	290	418	561	730	1152	2012
.06	14	25	39	58	81	141	223	327	356	454	614	800	1261	2203
.07	15	27	43	63	87	153	241	354	421	494	664	864	1363	2380
.08	16	29	46	67	94	163	258	378	450	529	693	923	1457	2545
.10	18	32	51	75	105	182	288	423	503	591	710	1032	1629	2845
12	20	36	56	81	114	199	315	463	551	647	869	1130	1783	3114
.15	23	40	62	92	129	223	353	518	616	724	971	1264	1995	3485
.20	26	46	72	106	148	258	408	598	712	836	1122	1460	2304	4024
.30	31	55	88	130	182	315	499	733	871	1025	1373	1787	2821	4928
.50	41	72	114	167	234	408	644	947	1125	1324	1775	2308	3643	6364
1.00	57	104	161	234	330	576	910	1336	1594	1870	2510	3266	5158	9000
1.50	72	125	195	290	405	705	1115	1635	1950	2270	3070	4000	6305	11015
2.00	82	144	228	334	468	816	1090	1894	2250	2648	3550	4616	7286	12728

Approximate Figures, based on 36 inches annual rainfall.

This table is used by scores of drainage engineers throughout the country who have found it of great assistance in making up their estimates on large public ditches as well as for making estimates on private drains.

To those unaccustomed to dealing with the problem, it is difficult to conceive an idea of how large a tile it will take to carry the water of any certain open ditch, excepting that it be merely a guess. One will say, "Oh, that ditch can never be tiled, as I have seen the water fill it brimfull and spread out twenty to thirty rods over the adjacent low ground." Another will say, "Tiling would not be a success with our ditch, as I have seen enough water down in that low ground to swim a horse; I have lived here thirty years, and know that it cannot be successfully done."

Nay, verily, "the world do move." Let a newcomer arrive in the neighborhood, who has been a petitioner and an active worker in a modern Illinois drainage district, where they have successfully used some two miles of thirty-inch as an outlet for over one hundred miles of lateral drains. He begins to agitate the matter, knowing full well the benefits to be derived, persuades a few of his neighbors to join him, consults an attorney conversant with the ditch laws of his state, and another drainage district is born. In due time, the old open ditch fades from view, luxurious crops grow above it, the old point rows are a thing of the past, and, as usual, none are more delighted than those who opposed it and who declared that it could never be done.

They had stood in their own light, since the advent of large tile, simply because they did not understand the scientific principles or the philosophy of the tile ditch. They had failed to take into consideration the absorbent qualities of the earth surrounding the covered tile drain or the increased velocity with which the water travels when confined in the tile and fed by numerous laterals of higher location, reaching into scores of miles, but stand at the abutment of solid masonry or outlet of one of those large drains, six hours after a heavy June freshet, and you are very likely to exclaim, "Is it possible that all of this volume of water passes through the tile?" Yes, it is true. Thousands of farmers realize it, are alive to the situation and are rapidly tiling their old open ditches, thus forever doing away with the annual cleanout, erasing the old eyesore of years standing, and adding many valuable acres to their estates.

The question with the progressive farmer today is not, "Can I afford to do this?' but the more serious one, "Can I afford not to do it?"

One drainage district in Christian county, Ill., having a twenty-seven inch tile for an outlet and with a gradient of less than an inch to the 100 feet, drains 2,850 acres; reference, J. W. Dappert, of Taylorsville, Ill., engineer in charge of the work.

Five drainage districts in Douglas county, Ill., each having a thirty-inch tile for an outlet and with a gradient of about one inch to the 100 feet, drain a little more than 3,000 acres each. Reference, W. E. Price, of Tuscola, Ill., engineer in charge of the work.

John Johnston began tiling his farm near Seneca Lake, N. Y., without book or chart, and also had to contend with the friendly (?) advice of his neighbors, who not only warned him against the useless expenditure of his money, but really questioned his sanity.

Today we have our expert drainage engineers, also books, maps and charts on the subject of tile drainage, and our doubting farmers have to but look over the fence and see the beautiful crops of his neighbor to be convinced.

Volumes might be written on the subject of tile drainage and yet much more could be told, but we are moving at rapid strides and what is news today is almost ancient history tomorrow. The old mole ditcher, two-inch tile, and also the old timber ditches, so common in Ohio and Indiana, and yet well within the memories of all attending this convention, are relegated to the rear and their place is taken by the finely tiled drainage districts, having miles of thirty-inch, twenty-four inch and twnty-inch tile for their outlets, with branches of smaller tile extending in all directions.

Hand in hand march agriculture and tilemaking, which, like the Siamese twins, are so closely allied that the very heart throbbings of the one are felt by the other.

The tilemaking industry has assumed mammoth proportions within the last decade and farmers are not only alive to the benefits of tile drainage in general, but realize the importance of forever doing away with the old open ditch.

In the language of our Hoosier poet tile-maker, Mr. M. C. Meigs, of old Tippecanoe:

"Most farmers lament the money they've spent,
For things only made to beguile;
But never as yet did a farmer regret,
The money expended for tile."

(Loud applause.)

General Discussion.

President Heafer: Gentlemen, this paper is now open for discussion.

Mr. Randall: I am requested to ask Mr. Stoll to step to the door as some one out in the hall wishes to speak to him. I doubt very much if there is any one here who will attempt to discuss this paper seriously, except to compliment the writer and the Association on having such a paper prepared for this meeting. The papers on tile drainage have not been very numerous during past years. On the other hand the discussions of this convention have turned to paving brick or other features of claywork which are considered more up-to-date in the clayworking business. The paper just read shows that tile drainage in many ways is very much up-to-date, and there is a great work yet to be done. The piece of tile which Mr. Cowgill has shown us makes it plain that the ancients knew a thing or two about mixing clays, and that, I think is the secret of the long life of the tile. Another thing which tends to long life in such materials is the temperature or climate of that country, which is warm and sunny, is it not, Mr. Cowgill?

Mr. Cowgill: It freezes in Athens.

Mr. Randall: They do not have such winters as we have here. I have had it geneous, it does not disintegrate in freez- which I was directly interested in—a tile roof on my house—that where the mass of clay is mixed thoroughly and is homogenous, it does not disintegrate in freezing and thawing, though it may be porous to a certain degree. In Europe they make roofing tile that the engineers and architects of this country would not use at all, it is so porous. The tile on my house will drink up water during a rain, so that not a drop of water will run into the eaves for ten or fifteen minutes after the first rain begins to fall. But there is no lamination, and if the tile absorb freely, they do not absorb enough for any freezing to affect them.

However, this is not what I want to say to you. I got rid of Stoll on a pretext. Mr. Stoll has notified several of us that he will not serve another term as Secretary. He has been serving this Association in that capacity for fifteen years. The success of the conventions have been due very largely to his efforts, and I want to suggest now while he is out of the room that we pass the hat and provide a fund by which we can buy a little token of our regard for him, which he can keep. Let Treasurer Hammerschmidt pass the hat and the President appoint a committee, consisting of the Ex-Presidents of the Association who are here, and include on the committee our present President and Frank Butterworth to select the present, and have it presented to him tomorrow morning before adjournment. I move that Treasurer Hammerschmidt take charge of the fund and if he don't get enough now it can be raised tonight.

Seconded and carried.

Dr. A. L. Converse: I want to say just a word or two in regard to this tile. I do not want to be skeptical, but it occurs to me that these are roofing tile that were used as conduits for water. I do not doubt that they were in the ground, but I doubt if they were used as a drain tile as we use them now, without some other evidence. All through these countries, the roofing tile are made about five inches at one end and three and one-half at the other. I have seen lots of them. They cut them through longitudinally. The tile are set with the small end down. These half tile are laid on the roof, and then other tile are reversed and cover over these cracks. These roofs can be seen in the city of Rome and Athens and a few in Pompeii. I think these same roofing tile were used as conduits for water. Millions of them have been made and have been in use for more than two thousand years. I speak of this because I do not believe they were used in a scientific process of drainage as we have it today. We have a very faint conception of the tile roofs and buildings there. They have stood for 2,000 years. These same tile are found on the Pantheon at Rome. These would run about 3½ to 4 inches at one end to 5½ at the other end—they were pan tile. They were made round in one piece and then cut apart, making two half tile.

Mr. Cowgill: There where I got these pieces, they were used in the house as a conduit or drain tile.

G. J. Walters, Chatsworth, Ill.

Dr. Converse: They were not used for drain tile as we use them today.

Mr. Cowgill: No, I did not mean to say that they were.

Mr. George J. Walters, Chatsworth, Ilinois. When we first started to make tile in my town something over twenty years ago, the tile were not burned very good, and when one of my customers came for some tile I told him I did not like to sell him those tile, but he wanted them so bad he took them anyway. These tile were put into the ground, and some of them were taken up this summer, and he told me they were just as good as the day they were put in, and they have laid there in the ground for over twenty years, and when I sold them to that man, I could cut them with a knife.

Mr. Jansen: In connection with the subject of drainage, there is work being done in Illinois today that would interest the tile makers, and that is the work that is being done by the government in making a soil survey of the State of Illinois. They have made surveys in St. Clair and one or two other counties, and they expect to make the same surveys in every county in the State. When we get these soil surveys, we can design formulas for the different kinds of soils and overcome the trouble we have with the different sizes of tiles.

J. M. Mamer, Campus: Mr. Lambert tells me that up in his territory, near Kankakee, there has been some 16 and 18-inch tile put in there, and open ditches closed, and it seems in that county it is quite rolling, and they have lost crops on account of the closed ditches.

Mr. Lambers, Marysville: This is the only case I know of. In order to get the water from what used to be an old swamp of one hundred and thirty acres, they had an open ditch, and had always got good crops. But they put in these 16-inch tile and closed up the ditch and for the last two years they have lost their crop entirely. It seems as if the water would not flow into the tile fast enough.

Mr. Whitney: I would like to know why they did not get out with a spade and dig down and let the water in.

Mr. H. A. Eudaly: That is very easy to explain to a man who has lived on a farm. You dig down with a spade and you don't hit the place at all. I think the gentleman's statement is true. I have known a circumstance of the same sort, where the open ditches have been closed and 15-inch tile put in, and the county authorities have been called upon, and the tile lifted and the drain left open, and that happened in Hamilton County, Indiana. I think you will find this the case in a great many places where open drains are necessary. You can put in large drains with all the small laterals you care to put in, and it would be impossible for the water to seek an outlet through these underground drainages in times of flood in time to save the crop.

Mr. Lambert: These people were under the impression that the tile were too small. I think the tile is plenty large enough. There used to be a four or five foot ditch, and they thought when they filled it and put in fifteen or sixteen inch tile they would have no trouble. They had a fall of from one inch to three inches in some places. I do not know whether the tile would run full or not.

Mr. Whitney: I want to say there was something wrong in the construction of that ditch. It was either too high at the opening where it is supposed to discharge the water, or else they did not use large enough tile. If they undertook to drain Lake Michigan with a rye straw they would have trouble, but if they used a tile large enough and put it in scientifically correct, they would not have lost an ear of corn.

Mr. Cowgill: I think it is more than likely that the farmers did not want these tile put in in the first place. I had an experience of exactly the same sort. I put in 20-inch tile, and a great many were out of humor about putting it in. It was to be the outlet for seventeen hundred acres. They were determined some of them that the tile should not go in, and they kept that ditch open for two years, and then the muskrats came and bothered them, and the township trustees took hold of it and made them put in 16-inch tile. That was four years ago, and we had a terrible rain, about two inches fell in one night and of course the whole country was covered up. They had just planted their corn, and they came to the tile factory and told me I had ruined them, they were going to sue me for damages. One man had forty acres of corn, and he said he would not have one grain left. I asked the man who re-planted the field how much corn he used, and he said "between a quart and half a gallon.". They had the best crop they had had in years. They have not lost a crop since. I guaranteed them that if any certain number of them lost a crop within five years I would be responsible. Some of them undertook to ring it in on me, but it did not work. If these 16-inch tile do not drain that land there is something wrong somewhere. The farmers have probably decided that it shall not succeed. In some cases it is a lot of contrary men. I believe there are more contrary men on a ditch than any other place under the sun.

Mr. Walters: I have had experience along the same line. I remember one of my customers came in and said his tile would not work. And the reason was that one man went out and took two or three tile out of the ditch and filled it up. Another time I had a customer for whom I could never get my tile cut square enough for him. I told him some time I would get them square enough for him. I turned out some six inch tile cut as square as could be. He put them in the ground and then kicked them together so that they were solid. Soon after a freshet came and there was not a bit of water got into the tile. The man came back and said, "Mr. Walters, the tile don't work, they fit too close." I said, "I told you tile ought not to fit too close." I like to cut them square for my own benefit, because they handle better in the kiln, but I never had any more complaints from that man about the tile not being cut square. It is best for the tile to be open. I suppose probably this big ditch spoken of was laid too close, and it may not have had enough fall.

Mr. Jansen: It seems to be that the cost of this 30-inch drain tile would be pretty high, so that it would be a question whether it would pay to put them in instead of an open ditch, when the value of the land is considered. I would like to ask something about the price of this 30-inch tile.

A member: You had better be careful, Mr. Whitney, everyone will want to make them.

Mr. Whitney: How many tile would you like to buy, Mr. Jansen? (Laughter.)

Dr. Converse: He probably will not want more than a couple.

Mr. Whitney: The price on board cars at the works is 75 cents a foot in length. As to the value of the land, I would like to ask him how much higher he wants this Illinois soil to go. At seventy-five and one hundred and fifty dollars an acre, it is pretty expensive to have many open ditches.

President Heafer: I see that Mr. Blair has arrived and we will hear his paper on "Competent Machinists for Clay Plants."

THE COMPETENT MACHINIST FOR CLAY PLANTS.

By. M. W. Blair, Terre Haute, Ind.

Gentlemen of the Convention:

I have been wondering why any one should have been asked to prepare a paper upon this subject rather than describe the action of a dry pan or a repress, and have concluded that our Secretary wanted an account of something novel and extraordinary, something new, perhaps in brickmaking, in order to hold the attention of this convention. The competent machinist may be familiar to some plants, but I take the flourishing condition of the repair men to indicate that he is not employed by most of us.

Brickyard help in general is incompetent, whether the character of the work being rough and dirty, as it is, tends to repel better men, or whether the wage question enters into it. I will not attempt to say, but it is a fact that the "handy man" is the best excuse for a machinist most of us can show.

Loyalty, honesty, and a capacity for work are absolutely essential to competency besides the technical knowledge which the term machinist implies. Loyalty is sadly lacking, our men are loyal to their union, loyal to their fellow workmen, loyal to their families, but not to their employers. It is one of the unfortunate conditions of the present time and in the machinist disloyalty has disastrous results. Leaving unreported the negligence of other employes, allowing machinery to run in a dangerous condition without protest, or the waste of steam and oil to continue day after day which with his knowledge he knows to be an unnecessary drain on the pocket of his employer, is disloyalty and is a quality not found in the competent man.

The machinist must be honest in his opinions as well as honest in his work. When consulted in regard to changes or repairs he must give his judgment as to the advisability of same. Difficulties must be honestly pointed out. If this were done by the machinist another less expensive way out of the trouble would often suggest itself.

His opinion on the condition of the machinery under his charge is perhaps most often required. This must be given freely, honestly, even if the answer means an all night job, in order to put things right. Many times the "I think it will run till Sunday," would spell "It must be fixed tonight," were our machinist honest in his opinion.

M. W. Blair, Terre Haute, Ind.

Much of the working part of a clay plant is in the dark. Who shall say except the machinist that the inside of the machine is in perfect order? And of what value is his say if he is not honest in his work? I recently saw an instance of dishonest work of this very sort. The machinist was sent under a dry pan to bolt the arms and screen plates. The under side of a dry pan is not comfortable or especially safe; but this condition must be met, not dodged. After half a day the pan was reported in perfect order and started. There followed a loud bumping and knocking underneath. On examination the foreman found that several bolts had been left out entirely, others were without nuts and that there was not a tight nut anywhere.

A very few minutes' run would have resulted in a wreck, loss of time, loss of money and perhaps loss of life. This incident merely emphasizes the fact that work on machinery which is not easily inspected must above all be honest work.

Capacity for the work varies with the individual. The man who can do the most accurate work in a given time should be given preference. But as quantity is generally governed by quality, the hurry up job is a money loser in the long run and knowing this the competent man will not allow himself to be hurried past that point where carelessness begins. But he kills no time in the doing and accomplishes much by steady application.

To be a clay plant machinist a man must adapt himself to its needs. These often make night work necessary and if he expects his help to be cheerful and willing and to show the proper interest in the work he must himself show the same disposition and not enter upon a job complaining of his hard luck in having to work all night.

These are points of personal character, but they are essential points. Who would risk, in his clay bank with a shovel, much less at his machinery with chisel and hammer a known thief, anarchist or loafer.

Technical knowledge and experience are part of every machinist's stock in trade. The application of these to a clay plant is not difficult, the hardest thing to thoroughly understand being the heaviness of the work and the resulting effect upon the machinery.

The work consists of a series of shocks and jars tending to crystallize shafts, loosen bolts and pound bearings out of line. The theory recently advanced by a correspondent of one of our trade journals that a shaft once in line and securely bolted stays for years is wrong. The very ground under a clay plant vibrates, strains on belts are unequal and in many plants the speed varies with the load.

Take off the lock nuts and run your plant a week, if it will hold together that long. Then see how many loose bolts you have and how much babbit has been pounded out of the bearings. Bevel gearing is a common nuisance about the plant. The shafts must be kept in perfect line or broken teeth and loss of power result. Now it is the duty of the machinist to look after these things. The competent man will inspect the entire plant from top to bottom at least once a day. He will tighten bolts, put in screws, in fact do whatever a rigid and thorough inspection tells him must be done. This finding of trouble in advance is his most important duty. More than this, if competent, he will not allow the same difficulty to present itself day after day. He will turn his mechanical ingenuity toward its solution and gradually the annoying delays and stops will cease. It is when the plant runs its full ten hours that the value of the competent man shows in the amount of ware produced.

There should be a knowledge of foundry and shop practice which will enable him to save time and annoyance. A knowledge sufficient to make a rough sketch of a machine part and properly dimension it will prove valuable in ordering repairs.

In general I will say that the man described is an impprovement on the "handy man," for the time has come when the clay plant must employ brain as well as brawn. (Applause.)

General Discussion.

Prsident Heafer: If there is no discussion on this able paper, we will take up the next, "Origin and Prevention of Fires," by Mr. H. A. Eudaly.

Mr. H. A. Eudaly, Sheridan, Ind.: Mr. President, and Gentlemen of this Convention, this subject is one that has attracted my attention more or less for the last twenty years. Twenty years ago, I made up my mind that the best thing I could do would be to do something in some way whereby I might escape fire.

I have been following that plan pretty carefully until the last five or six days I find it behooves me to do something to get a little fire, and I have since been building fires. With reference to this paper, I am a little like the fellow who joined the church. After he joined church, he became very happy and engaged in prayer and in the course of his prayer he said something that did not sound just right, and the boys began to snicker. The man raised his head and said, "I seed I'd played hell as soon as I said that." Laughter.) And that is the way I am with this paper. Last year I promised my personal friend here, Mr. Stoll, that I would prepare a paper on this subject. As you know he is one of those fellows who do not forget easily. I want to answer our friend Randall who touched on a personal question a little while ago. I am not a brickmaker, nor the son of a brickmaker, nor do I expect to be. Neither am I in any way connected with the brickmaking business at the present time, and the man whose duty it is to look after this red tape is not here with the necessary. I think he will be here this evening. In fact, he said he would and buy the badge. The only reason why I am here, and the only reason why I complied with my friend Stoll's request with reference to this paper is because a Good Samaritan told me that if I would come he would pay my expenses, and here I am, and he will know I am expensive before I get away from here. I have endeavored to write a paper on this subject which I will read.

CAUSES AND PREVENTION OF FIRES ON BRICK YARDS.

By H. A. Eudaly, Sheridan, Ind.

Gentlemen of the Convention:

I have been asked by your worthy Secretary to give a paper on the above mentioned question, for the benefit of this convention, and the craft at large, I can answer this question in a very few words, only for the fact that it might not be applicable to all alike, I could say that the causes of fires is poorly constructed plants, and the prevention would be to build nothing but fire proof buildings.

This would hardly be fair to the average brickmaker, for the simple fact that all men engaged and being engaged in the brick and tile business are not so situated, as to be able to construct strictly fire proof buildings, wherefore it becomes necessary to advance some idea that equally applies to the rich and poor alike, I think first, in the average brick plant throughout the country is subjected to fires more through the neglect of some careless employe than any other one thing.

Second, lack of knowledge on the part of the person in charge is another thing.

Third, improper construction is another cause, and in fact the prima facie cause of all fires.

First, give me a first class man, ever watchful and attentive to business, and the risks of fires even on a poorly constructed building will be reduced at least 50 per cent. over one who is careless and unconcerned in regard to the company's welfare.

Second, a first class attentive man, through the lack of knowledge, may be visited by a first class destructive fire when entirely unthought of, which was the case with your humble servant at one time, I will narrate the circumstance, that some poor soul that may be as ignorant as I was in the past, may be benefited.

While in Springfield I erected a permanent clamp kiln, I say permanent to convey the idea that it was built for continued use, it was 36x75, 25 arches, giving a capacity of about 400,000 brick, the grate bars extending in from either side 12 inches, leaving a space of dead floor through the center of 12 feet. Kiln was shedded on each side with 14 foot pine grooved boards, in order to provide shelter for the burners, roof being 6 feet above the side walls at the eaves, supported by heavy oak timbers placed every 6 feet along the side of the kiln and tied across the top by iron rods, the center section of roof was raised 2½ feet above side section, in order to give ventilation. In addition to this every alternate 6 feet of the side section was left loose, for the same purpose, these loose sections were taken off while burning. We burned this kiln several times, apparently in perfect safety. The last burn we burned the shed, and only for the good fortune the wind being right, and having the fire department on the spot, the entire plant would have gone the same road, all for the lack of knowledge. Everything went well while burning the kiln; the trouble all occurred six to eight hours after the kiln had been finished, at the inquest the evidence disclosed the fact that the cause of the fire was produced by a failure to close the ash-pit, and the heat of the kiln was drawn off too rapidly.

Now as to improper construction; I believe more fires are caused by faulty dry sheds than any thing else. Of course I would say even in a wood structure, have your boiler room either isolated from your main building or inclosed by a solid brick wall, taking extra precaution to keep all steam pipes and fittings entirely free from contact with any timber; proper precaution should also be taken in regard to bearings of all kinds, however faulty construction of dry sheds is to be regarded as the greatest cause of fires. I have seen dry sheds apparently constructed for the purpose of adding to the inflammable properties of some, rather than to diminish the causes of fire. This is done by filling the space between the ceiling and roof with sawdust and shavings obtained from some near by sawmill, or planer. This is done, I presume, on account of the apparent cheapness.

H. A. Eudaly, Sheridan, Ind.

It appears to me, that it would be much better, and I am quite sure just as cheap to make a fire proof building, to sart with, which can be done in the following manner: Build your walls up of brick, allowing space between walls sufficiently wide to receive two cars, after the first tunnel is completed you can make your dryer as wide as desired.

By adding more tunnels, for a covering I would suggest that you use T Iron across the top, to support the roof; let the T Iron be spaced every 16 inches covering this space, with double length brick grounded in cement mortar; then use another course of brick running in the opposite direction and thoroughly grout this course and I will guarantee that you will not be troubled with fires caused by the dry house, and I again assure you this can be done even cheaper than you can erect a wood structure, of the same capacity. Of course with this style of structure the intervening walls will gradually get higher as you approach the center of structure in order to give pitch or fall to roof. Another method would be to build the walls all of equal height, allowing only 8 inches space between the T iron covering as before, except after the first course of brick is well laid. Grind clay the same as for brick, covering it to the roof and allow the center to pile up to about 8 inches sloping uniformly to the sides, bring the sides to a plane, and the brick and cement as before, which will make a perfect roof and at the same time be absolutely fire proof.

Now, gentlemen of the convention, I suspect I have said enough to provoke a discussion, and if so, this is all I desire. Yours, in favor of fire proof buildings, and careful men in charge in order to prevent fires, at the brick and tile plants. (Applause.)

General Discussion.

President Heafer: I hope some of you will have something to say in regard to this paper.

Dr. Converse: I think, Mr. President, that there is no manufacturing establishment on the face of the earth that has as many fires as a brick plant, and none that is built so cheap. I think the majority of them are fire traps from the beginning to the end, and the end is usually when they go up in smoke. We think we have them fire proof, and then we find they are not perfectly fire proof, but part of the building fire proof is better than none at all. It is astonishing how many fires occur just through foolishness of those in charge. I went into a church about two weeks ago and went down into the basement where the furnace was in operation, and they had a janitor there that they had the utmost confidence in. The damper had been broken, and he wanted to stop the crack and make it air tight, and so he had put two or three folds of newspaper against it and then he had taken a broom and turned it with the broom side up and propped it up against that paper so he could make his furnace air tight. I have seen things pretty nearly as foolish as that about a brickyard. I know a man who knows almost as much as I do, at least he thinks he does. His wife was a firm believer in the use of coal oil. This fellow cut his finger, and his wife got a rag and saturated it with coal oil and wrapped it around his finger, and tied it, and the end of the string was longer than he wanted it and so he lighted a match and burned off the end of the string. (Laughter.) Now that fellow knows as much as I do—about that finger. Now, seriously, just look over in Chicago. You need not stop to think about that asbestos curtain, and the amount of money those fellows had in that theater, without considering the terrible loss of life, think how careless and foolish the apparatus was with which they tried to work that asbestos curtain. I remember the man who wanted to catch a colt. The colt had been caught several times before, so the man did not want the colt to know he had a halter with him, and he tied the halter to his foot, and with some hay in his hand he called the colt, and when the colt got near enough he reached down and put the halter on the colt's head (Laughter) and when he had done that he knew in about a minute that he had made a mistake. We, all of us, make mistakes at times. It is becoming that we each of us be on our guard.

J. W. Robb, Clinton, Ind.: I agree with what has been said of the carelessness of brickmakers in general. As. Dr. Converse has very well said, and as you all very well know, they build fire proof buildings all the time, and they burn up sometimes quicker than the fire traps such as the one referred to in Chicago. Last week in our town, we had what was supposed to be a fire proof school house. The janitor said there had not been any fire in the school house for four days and yet it burned down in about twenty minutes, and so there is no way in which we can apprehend fires. If there was, there would not be so much money put into insurance policies. I think it would be entirely out of the question for clay plants to be entirely free from fires. We put the most of our money into the fire to put under the clay, and consequently we get very careless with the things we handle daily. The kiln fireman or boiler fireman does not pay much attention to fire after he has handled it every day,—just like the coal miner who goes into the mine with his keg of powder and sits down beside it with his lighted pipe and takes a smoke. It don't burn him today, nor possibly tomorrow, but bye and bye, it does and the same thing is true of many of us. There should certainly be an improvement in the construction of brick plants. Somcone said they believed ours was the most hazzardous business, but I want to disagree with that statement. I think coal mining is worse than brick-making, although we all think we have the worst business. There are other people in the same boat.

Mr. Butterworth: I want to disagree with Mr. Robb in regard to fire proof buildings for brickyards. I used to think the same thing. Not long ago, I visited a gas plant in Milwaukee, similar in several respects to the requirements of a brick plant. They built their walls of brick, their rafters of steel, with steel purlins, and a clay shingle roof, and there is not a single thing about that plant to burn with the exception of the sashes, and I think there is no question but that we can build like that if we will, and want to spend the money to make our plants absolutely fire proof.

W. M. Pratt, Earlville, Ill.: Where are fires most liable to occur—in direct heat dryers or waste heat dryers, and what is the danger where steam pipes come in direct contact with the wood?

Mr. Eudaly: I would like to ask if there is anyone here in the convention who can tell just what temperature, the ordinary pine board or hemlock board will stand in dry heat before it will ignite. You will remember a year ago, I had a paper on the subject of dryers, and I am not going to raise that question now for I see there is another paper on that subject, but I made a statement last winter that we carried in our dryer 500 degrees of heat. That, of course, was the temperature shown by the thermometer. I never knew just the heat in the dryer, but I know that when it went out a little above the 500 degrees the slats of the cars would ignite. If any one knows the temperature at which perfectly dry pine board will ignite, I would like to know what it is. I was never convinced in my own mind what caused that fire in the kiln roof referred to in my paper, unless it was the ash pit drafts. We had burned that kiln several times, but it was seven or eight hours after we had closed it up. We had the fire department there three of four times.

Mr. Butterworth: What kind of boards did you use in your kiln shed.

Mr. Eudaly: I think there were hemlock boards.

Mr. Butterworth: Might it not have come from the rosin dropping.

Mr. Eudaly: No, I think not. This roof ignited at the very highest point about fourteen feet from the top of the kiln.

Mr. Butterworth: I give it up.

Mr. Hammerschmidt: Was it a quiet night? While the wind was heavy it would drive the heat both ways, but if the night was quiet it would drive the air right up. Now about the steam. We have steam pipe resting on wooden joists, and we keep a pressure of eighty pounds of steam at night, and we have never had a fire from it.

Mr. Eudaly: I saw a steam pipe in our plant ignite a pine board that it rested on; not only, once, but two or three times.

Mr. Hammerschmidt: What made me feel safe was, we had two or three steam pipes from our engine laid on the joists. I had a steam fitter there one day and I said I want to have that cut out under those steam pipes, and he said: "Never mind, it will never ignite. That has been over eighteen years ago, and there have never been any signs of fire.

Treas. Wm. Hammerschmidt, Lombard.

Mr. Robb: For the benefit of Mr. Eudaly, insurance experts tell me that dry wood will ignite at 580 degrees. That is if a pipe is laid next to dry wood for a series of days or months and years, it may be until it becomes blackened, it will ignite at 580 degrees. I remember an experience like Mr. Hammerschmidt's. We had a manager who said steam pipes would never set fire to wood, and we took down some steam pipes, and we found that the joists had been on fire at some time. In regard to Mr. Eudaly's fire: We have never had any experience with up draft kilns, but I have frequently seen the heat force us away from the fire boxes, perhaps six or eight hours after the kiln had been shut down—you could not pass along within six feet of the kiln. Some gentlemen here suggests dampers. We do not close the dampers in our kiln at that period.

President Heafer: The next on the programme is "Continuous Kilns" by P. L. Youngren, of Milwaukee. Mr. Youngren is not here and has not sent his paper. so we will pass on to the next, "Road Construction," by Mr. F. S. Selley, of Danville, Ill.

Mr. F. S. Sulley, Danville, Ill.: I have written a fool piece here which I guess some of you will have to read.

Mr. Randall then read Mr. Sulley's paper.

ROAD CONSTRUCTION.

By F. S Selley, Danville, Ill.

Gentlemen of the Convention:

I am glad to see you in this prosperous town of Danville, a place surrounded by coal and shale, which will interest you. Well, they gave me a hard nut to crack, 'Road Construction." You should have gotten some one that knows more about it than I do, and there are so many different opinions about roadmaking. If you see a tileman he says tile them, the brickman, brick them, the stone man pike them and the gravel man gravel them, and so on, and the farmer is perfectly willing to have good roads, providing the other fellows pay for it; but before I get down to roadmaking I have a few words to say about some other things, and I very likely will get my foot into it before I get through. I am not much of a brickmaker, and that stuff of mine don't take much of an expert to make brick out of it, and with little trouble they make a fine black front brick.

As far as brickmaking goes, Shea, Butterworth and Curry can tell you all about it, and George Roberts, of the Western. can tell you something about burning. There has been a great deal said and written about the Western Brick Yard and there is no use to talk it over again, and you can see for yourself there must be something in this brick business; it must be fascinating and elevating or something else when you see such men as Chas. Ridgley, Dr. Converse and others engaged in it. Now the Puringtons always dabbled in mud, even our Hon. Mayor of Danville made brick. What a nice thing it would be if you could send such men as Purington, Dr. Converse, to the legislature. Oh, yes, Ed. Heafer and some others could do you some good. Why they would have all the roads tiled and paved with brick. You could be proud of them and these corporation lawyers could not influence them very much. Dr. Converse just flopped in time to be in the swim, and he might have been there if they had not beat him out of it; your brick and tile men would have money to burn and help your poor connections. What helps the paving brick men will help you.

I will give you some of my experience as a former contractor.

1st. Keep your prices up and be neighborly, remember your competitor has to live as well as yourself.

2d. When you sell 1,000 brick, be sure and give a 1,000 brick.

3d. When you have a soft, good for nothing brick, show them to the buyer before you send them.

4th. If you promise brick to a buyer keep your word good and don't disappoint him.

Now, a few words about brick paving. I think it started in Bloomington and Napoleon Haefer and James McGregor were the starters of it. They were in the brick business. They had a large quantity of swells, soup bones and rough brick, they were hard and not fit to go into a wall, and by some accident or otherwise, he concluded they might do for the street. They had a rough pavement built out of Joliet limestone which proved to be a failure; well, Haefer put down his swells and they beat Joliet stone; but it took an artist to lay them.

I helped one of your big members out; he had a good many of them, he don't make that kind now. I suppose he forgot all about those times when he was a kid brickmaker, he is all screen now. I saw some poor brick paving a few days ago in a great brick town. But oh, what paving, poor brick and poor work, some very poor paving in other places. Why, the Purington's were not in it when you heard them talk about the quality of their paving brick.

I had one who made paving brick to go to Galesburg with me; at home he had the best paving brick in the country. At Galesburg he told Billy Purington, "Oh, I only run a little brick yard in connection with a coal shaft." But those days are passed, and there is great improvement in the brick business, and there will be some more. The present paving contractors have a picnic besides us old fellows, but I don't know if they are any more honest.

One more word to the paving brickmakers. Don't sell brick to slouchy contractors that don't do their work well, if you do, you will kill the goose that lays the golden egg, and the asphalt ring will get away with you, as they have done in some places. Have a contractor that will do his work well. Keep your poor brick at home and brick paving will be the paving for time to come. Pay more attention to quality than quantity.

You could experiment, and pave a few streets yourself and set an example for good work.

Sorry that there is snow on the ground; there are a very few good streets in Danville, some of the Shea brick, some of the Western. Oh, yes, I have two blocks of my brick, not much to brag on. When D. V. Purington brings his Improvement Comm. city engineer from Chicago to go to Terre Haute, we want him to stop here, we will show him one street or more where there is heavy travel and in first class condition. Now if you see this Great Western Brick Yard, don't get scared and discouraged, because you can't have one like it, it will save you lots of worry and loss of sleep.

Remember that in a hill of potatoes there are only a few big ones and plenty of little ones, and maybe we will have a chance to grow, providing we don't grow like a beet, but is there not some danger that these great brick and tile plants built in the last few years will swallow us, as the big fish will eat the little ones. Now, in brickmaking, there is plenty to learn, a great field for young, active men, your old heads don't know it all, and I hope some of you will give us some new practical ideas, so you don't have a patent on it.

You can hear and read a great deal about patent kilns, and they all have the best one. You have some machinery men here that will give some new wrinkles; there is Brown, Gledhill and others, nice fellows.

Now I am surprised at Illinois Brick and Tile makers, it seems nearly all the brains of this convention are from Indiana; even Butterworth and Curry are Hoosiers. Have you said your piece at former conventions and can not be wound up again to grind out another piece? But we are glad to meet you Hoosiers and learn what we can. Why can't we combine the two states and make it Illinois and Indiana Brick and Tile Makers? I see you are like the Methodist preachers when they go to a conference, you have on good clothes and are well dressed and must be prosperous.

But now I am coming to the point. They ask me what I know about Illinois mud roads. What do I know about them? Many times I found no bottom, I could tell some stories when I used to see the girls in the country years ago. Could tell you considerable about mud roads and some water thrown in. I suppose some of these old fellows could do the same thing, and the ponds in the spring and fall full of water. They are to furnish medals for all the tile makers in the country for helping to improve those black, lowlands, but some would be entitled to only leather medals. Now they are crazy to buy that black land for $150 an acre, even if they have roads that have no bottom at times.

Now, how to improve these roads is quite a question, as the material is not very plentiful. I am only conversant with the country east of Illinois river.

Nearly all the gravel banks are owned by railroads that are good for any thing.

There are some gravel roads about Decatur. They are fair when it don't rain very much. There are some near Bloomington built out of Novilite from the southern part of the state, near Cairo. I was there with some civil engineers and it seemed to be a failure, but it may be better now.

The macadamized and gravel roads about Danville were bad. The road leading to Western Brick Yard was impassable for brick and coal wagons. I suppose they will be no better this winter, as the Commissioners with a stuff painted it red from the coal mine. I paved a street in Lincoln and the boys made money selling horse shoes the horses lost in the mud. Messrs. Ridgley and Converse will tell you about mud in Springfield, but what is the use to talk about mud in a few places when all of Illinois was a mud hole and is still a mud hole in the spring of the year whenever it rains. I saw a good many gravel and rock roads in Indiana, Ohio, Kentucky, Missouri and Tenessee. Some of them are fairly good, but the soil is very different from our Illinois land. In Tennessee they are nearly all toll roads and very rough; in all these States they have plenty of stone and gravel. I will give my experience about Mattoon, Illinois, where there is black mud. I did some paving at Mattoon. The surrounding country is mostly flat and level. They hauled some sand and gravel from the creeks. It made no roads, but it kept the mud from sticking to the wheels, but in a year or two it was lost in the black mud. They built one macadamized street there; the work was well done under the first class, good honorable engineer; the one that did that good paving in Terre Haute, so much is said about, and the stone came from Greencastle, Ind., but in the spring of the year, or whenever it got muddy, the black sticky mud on the wagons would carry it away and leave the lower stone bare. The city council, after a great deal of trouble and litigation, paved it with brick on top of macadam. Mattoon township graveled a piece of a road with a cement gravel from Makinaw Creek, near Pekin; but that kind of gravel is very scarce; it did very well for several years, but don't know what it is now. There is a piece of road from the end of paving to the I. O. O. F. Old Folks' Home, over one mile long, paved with brick. It is eight feet laid with one course of brick set on edge, with planks eight inches wide on sides to hold paving in place; some of it has been in use several years and is very good today. Now you get specifications for a road of that kind from some good civil engineer.

W. S. Purington, Galesburg, Ill.

I believe the work can be well done for $5,000 a mile; now it would not be a burden on the Illinois black land worth from twenty to thirty thousand dollars for 160 acres. The expense would be about $1,250 a quarter section. It would be only about five per cent on its actual value. You will find your Illinois farmers well fixed; you generally find a family carriage; if there are sons and daughters, each one has fine horse and buggy; have telephones and rural deliveries. I don't know what else they want, if it doesn't cost them anything. And what a time these mail carriers do have to carry the mail for them in muddy times, and they would kick if the poor fellow should miss or be late on account of mud. I saw a piece about the Grange advocating good roads. It was very good till it came to paying for it, then they wanted the general government to pay for it; so it will be with a great many farmers; they want good roads but they will take mud before they will be taxed to pay for them. I would advocate one state fund to be used for road purposes, and that is the revenue derived from the Illinois Central Railroad, but how it could be done we will leave to other parties that know more about it, or when Converse, Purington, Heafer and others will go to the legislature.

You are aware what amount of money is collected for road purposes and if that money had been properly applied for the last ten years we could have a good many miles of good permanent roads, and our principal roads could have been made good for heavy traffic in muddy times.

Now, when you go home, use your iuflnence with your members of the legislature, your supervisor, your commissioners, and your farmers, convince them that they can save money by having good roads. If they do pave a road, see that the work is done well and the brick are all right, and so they don't send you culls and seconds; the paving brickmakers are not all angels. Another matter is, elect first-class men for township commissioners, men that have judgment and are good business men. (Applause.)

General Discussion.

President Heafer: This paper is now open for discussion.

A Member: What width road is referred to in your specifications?

Mr. Selley: Eight feet wide.

President Heafer: This is a very intersting paper, but it is getting so late that we had better pass on to the next which is a question for general discussion.

"Does it Pay to Use a Steam Shovel for Small Plants?"

I would like to have someone answer that question.

Mr. Robb: I am very much interested in that question. I operate a plant of 45,000 daily capacity and I have been investigating the matter in a certain way, but have been unable to decide in my own mind as to whether it is practical in a shale pit to use a steam shovel without blasting the shale If we have to blast the shale before we put the shovel in the pit, I fail to see where the profit comes in. Mr. Purington over there shakes his head. There is a great deal of difference between our plant and Mr. Purington's. I would like to ask how far up a bank they can cut shale with an ordinary steam shovel—20, 30, 40 or 50 feet, and what kind of shale they can cut with an ordinary steam shovel. The shale we have is of two qualities. In the lower part of the bed is a rich aluminous shale, in the upper, it is rich in silicia and very hard. The lower part could be cut with a steam shovel, but the upper part would have to be blasted, and in that case we would lose the benefit of the admixture. Mr. Butterworth uses a steam shovel and Mr. Barr and Mr. Purington, but the capacity of their plants is very much larger than is meant by that discussion. I would like to hear from them as to what they think of these different propsitions.

Mr. Purington: I shook my head because he thought the shovel would not be able to dig his clay or shale. There is no question about it. There is the necessity of blasting the top where you are working a bank 25 feet or more high, but the top is thrown down and you get the mixture of both. I used to advocate a steam shovel for a plant of 60,000 capacity, but I think Mr. Robb would find it to his advantage to use a steam shovel.

Mr. Butterworth: You cannot operate a steam shovel for less than $15.00 a day, and it does not make very much difference whether you are digging for 50,000 or 200,000 capacity, the expense of operating is just the same. It is an easy matter to find out the cost of digging by hand and compare it with the cost of digging by steam shovel. So far as it being practical to dig a shale by steam shovel, I agree with Mr. Purington. There are very few clays or shales that I have seen that could not be dug by steam shovel. The only thing that makes it necessary to blast is the excessive height. If you can work your bank in two levels and dig each in 20 feet, there is no necessity for blasting, except in very cold weather when there is 25 or 30 inches of frost in the ground.

President Heafer: Mr. Barr, you are using a steam shovel I believe. What is your experience.

Mr. Barr: I do not know that there is very much more to be said about it. We hesitated for a number of years about putting in a steam shovel, claiming our shale was harder than any one else's. We finally put in one, and we have never had any trouble. I do not think there is any question about a steam shovel being able to dig any shale in this country. If you go over 20 or 25 feet in height, then you have to blast.

Secretary Stoll: This seems to be all of the business for the afternoon. If any have come in who would like to get their badges they can come up here after adjournment and be enrolled. This evening, as you will notice by the programme, will be our annual banquet. We hope you will all be present. Dr. Converse will be toastmaster.

President Heafer: I will announce as the Committee on Resolutions:

F. Plumb, Streator, Ill.
W. S. Purington, Galesburg.
D. H. Jansen, Pekin.

We will now stand adjourned until tomorrow morning at 9:30.

Second Session.

Wednesday Morning, January 6.

President Heafer: Gentlemen, we have quite a lengthy programme and will waste no time getting at it. Secretary Stoll will announce the first in order.

Secretary Stoll: The first paper is "The Pug Mill," by Mr. W. B. Corliss, Cayuga, Ind. He has been called home, but he left his paper which he asked me to have read for him, and I will ask Mr. Randall to read it for me.

Mr. Randall read Mr. Corliss's paper, as follows:

THE PUGMILL.

By W. B. Corliss, Cayuga, Ind.

Some few weeks ago I was tendered the subject, "The Pugmill," by your most efficient secretary, and I trust that you will not blame him for his error in assigning this to me. In my estimation, the subject should have been given to some of you older brickmakers who have had years of experience and I been allowed to listen instead of the reverse; however, I will proceed.

The pugging of clay in my estimation is one of the very important parts of the careful manufacture of brick. It certainly requires a sober and industrious man and the proper manufacture of stiff mud brick greatly depends upon him and it is also very necessary to see that your clay or shale is properly pulverized. This also aids the pugmill to do its duty.

Careful attention should be given to its repairs, and see that the knives do not get worn so nothing would hinder the proper tempering of the clay before it enters the mill to be pressed into the form of brick.

W. B. Corliss, Cayuga, Ind.

At my factory, we have three different grades of shale, namely, buff, red and a shale that burns a deep chocolate color and works similar to the buff toward pugging. Our buff shale is a very peculiar shale to work. It contains a great deal of fat and is easy for the mill to run in, but it is a very difficult thing to get the shale properly tempered. We used to have a great deal of trouble with our shale in this way. It seemed to lay dead in the mill, that is, it would turn up and buck, if I may term it that way, and some of you will say that some of the knives of the mill were short, but they were not. This was my opinion, but I got new knives and it worked the same. We, at this time, were running about 140 revolutions per minute, so I tried the experiment of running the wheel 45 revolutions and I was successful, and the clay moves out; therefore this was overcome. I cannot understand why that it did this and I would like to ask if any of the other brickmakers ever had any similar experience. Will leave this subject to your discussion. (Applause.)

General Discussion.

President Heafer: If there are no remarks on this paper, we will pass on to the next, "Scientific Tile Drainage," by Mr. J. J. W. Billingsley, Indianapolis, Ind.

Mr. J. J. W. Billingsley, Indianapolis: It has been several years since I looked into the faces of the members of the Illinois Convention. I am reminded of a remark that Governor Foster once made to the convicts at Columbus, Ohio. He was called upon to address them and he said, "I am glad to see you all here (Laughter), and so I am glad to see you all here this morning.

UNDERDRAINAGE THE BASE OF BEST SOIL IMPROVEMENT.

By J. J. W. Billingsley, Indianapolis.

It is an important truth, that the Creator has stored our soils and sub-soils with marvelous riches, for the use of mankind, in the fertility that is available and unavailable, except as we make it of use by our own special efforts. It is estimated that there is in most of the clay soils a sufficient amount of potash and phosphoric acid to grow farm crops for a century or more, if we return from time to time, the waste of farm products, excepting that nitrogen, another leading element, is not so abundant in the soils, but which may be had by growing such crops in rotation as to have the power of taking nitrogen from the air.

Much of this fertility is insoluble or unfit for plant food in its present form, and can only be made fit for the use of vegetation by adopting such methods of soil improvement as will secure circulation of air through the soil and sub-soil.

The extent or magnitude of this store of fertility is beyond our power to compute; when we take into account the fact that, at a depth of many feet in the drift soils, the earth, composed in most part of clay, holds in great abundance the two leading elements of fertility, viz., potash and phosphoric acid, together with other elements important in plant growth, but unavailable until they are rendered soluble by the action of the air, heat and moisture.

A portion of hard pan clay taken from a depth of five or six feet and exposed to the air and heat of the sun, will fall apart and changes to fertile soil. The same action will occur if the necessary conditions are provided to secure a circulation of air through the clays lying beneath our soils.

To do this, the excess of water must be removed by underdrainage (tile drainage.) Without underdrainage this great storehouse of fertility is locked effectually against plant life, however much we may till and reap farm crops from the surface soil. There is not a more important truth in the agriculture of today, strenuous as it is, than that we must underdrain deep and well, if we draw on the immense store of fertility that is held firmly in the grasp of the underlying strata of clays, upon which our surface soils rest.

Underdrainage not only serves to make the underlying fertility available, but it will in a large measure prevent the washing of the surface soil. It is claimed that the waste of fertility from the surface washing of undulating land, in cultivation, is quite as much as that used by the crops grown.

Observation teaches us that every heavy rainfall that rushes off over the surface carries away the fine particles of soil and decayed vegetable matter into the rivulets and streams, never to return, which is evidenced in the muddy water which is often dark dyed with the best of manures and fertility applied to the surface soil.

Besides, we know that at other times the water of attraction which rises from the depth of earth beneath brings in solution soluble fertility, the water passing off into the air in the form of vapor, leaves the fertility at the surface, which is likewise washed away. In addition, the water in its descent through the air washes out the nitric acid and carbonic acid, important factors in plant growth, which is also washed way, making a fourfold loss, viz., the fine particles of earth and vegetable matter, the fertility brought up by the water of attraction and that brought down out of the air by rainfalls.

To prevent this immense waste of fertility, underdrainage is the only effectual and permanent method of preventing this ruinous loss. Underdrainage makes the soil open, porous and friable, readily permitting the water to percolate through the surface soil and subsoil to the drains below, thus preventing the surface washing, and consequent waste of fertility.

The crops grown and harvested and sold off of land not underdrained, the shallow breakings, and the surface washing of the soil has brought about, as a farmer expressed it, "a hide bound" condition of the soil—the surface of clay soils run together, forming a crust, which breaks up cloddy, requiring much labor to make a satisfactory seed bed, and the same condition often occurs during the cultivation of crops, preventing the circulation of air through the surface soil, so important to plant growth.

Other Advantages of Underdrainage.

We briefly mention as follows, it takes out the surplus water in the soil, which is a serious detriment to the growth and perfection of vegetation, thus always insuring a full crop, when frequently not one-half of a crop is matured on like soil not underdrained. Underdrained soils are susceptible of earlier cultivation, thus practically lengthening the season for growth and maturity, which means greater yield and better quality of crops grown. The soil being much more open and friable is, therefore, more easily tilled. Underdrained soil is rendered open and porous to the depth of the drains, by the percolation of the water through the soil, and the extension of the roots of growing crops which afterwards decay leaving innumerable fine openings through which the air can circulate, and effect important chemical changes, rendering insolnble fertility soluble or available for plant food. The open porous condition of drained soil admits the air and the warm rains penetrate the entire mass, increasing the temperature, from six to ten degrees, securing a better germination of the seed and a more vigorous growth of vegetation.

The porosity of the land thus secured facilitates the admission or the escape of air and heat, which is important in promoting the deposit of dew upon the particles of soil, a deposit of moisture like dew is constantly going on in deep, open porous soils, when the air penetrating the soil is at a higher temperature than the soils, which is of the highest consequence in securing a vigorous growth and the better development of vegetable life. This well known fact has been observed in the better growth of farm crops on drained land during a drouth. Deep, thorough underdrainage serves to conserve the water of rainfalls, the water passing down through the soil and subsoil is held upon the surface of the soil particles, to such an extent that the water of a heavy rainfall, of one inch or more, is held for the use of plant growth. After the rainfall ceases, the capillary action begins, the water ascending by attraction, carrying in solution the plant food, to be taken up by the feeding roots of growing crops. If the good husbandman makes the surface fine, an inch or so in depth, there will be practically little of the water escapes by evaporation at the surface, thus conserving the water almost wholly for the use of the growing crop. The statement that lands are underdrained to get the excess of water out, and to get water into the soil, though seemingly contradictory, yet it is true in fact.

—Nitrification—

All soils contain more or less of vegetable germs, or plants of a very low order, so small that they cannot be seen without the aid of a microscope. These invisible plants are known as bacteria, and by their action or growth, they in some way cause the oxygen of the air to unite with the nitrogen in the soil and the ammonia, thus forming nitrates (or compounds of nitric acid with other substances) in the soil. This formation of nitrates in the soil is called nitrification, and its importance is due to the fact that nitrates contain nitrogen in a form which is readily available for the use of plants.

Prof. Shaw says: "In order that nitrification may take place, at least four things are necessary: First, the soil must be sufficiently porous to let air pass down freely among its particles; second, the soil should be moist, but not wet. Moisture is necessary, but an excess of water prevents nitrification; third, there must be a certain amount of warmth, we cannot say how much, but we know that nitrification takes place most rapidly at summer temperatures and apparently ceases near the freezing point; fourth, the soil must contain lime, potash, soda or some similar substance, to unite with the nitric acid, so as to form nitrates." And then adds the following conclusions: "These conditions so far as the farmer can control them, are best secured by underdrainage and through tillage." Underdrainage being the base upon which to biuld for the best soil fertility.

J. J. W. Billingsley, Indianapolis, Ind.

The drained soil and subsoil being open and porous, and much warmer than the soil not drained, other things being equal, will best promote nitrification. The importance of this feature of soil improvement is not generally appreciated for the reason that it is not fully known by many farmers, but is very forcibly demonstrated in the thorough underdrainage of lands to a depth of three or four feet, which afterwards quite doubled the crop yield.

With the foregoing advantages of underdrainage thus briefly mentioned, and many others, that might be added, the farmer has a means of increasing the capabilities of his soil by adding to its depth, and better mechanical conditions and its capacity for production by underdrainage wholly independent of increasing the number of acres.

That is, he may own a farm of one hundred acres and thoroughly underdrain it, to a depth of three or four feet, and draw upon the available fertility to a depth of one, two or three feet, as his crops may have need, and thus increase his crop production equal to the production of two hundred acres of similar soil, not underdrained and cultivated to a depth of only six inches—a very common depth. With the latter he is at a greater expense to fence, pays twice the money in the purchase, and is at double the expense to plant and till, and pays twice the amount of taxes. As a plain business proposition, it is much better to own the 100 acres and thoroughly underdrain it, and thus increase its capacity for production, rather than to add to the acreage and not underdrain.

The advantages of underdrainage may be had at a cost of $20.00 per acre or less and the expense returned in the increased yield of one or two crops and the saving of labor required to fit the soil for planting and timely cultivation. Besides, if the work of drainage is well done he has a lasting improvement, one which will give satisfactory returns for generations to come.

Established reliable business conditions is important in farming as in other vocations. The certainty of growing a maximum crop every year makes it possible for large returns. The average farmer cannot afford to occupy a farm for a country residence and a bare living. Improved lands have advanced in value to such an extent that makes it a financial consideration to buy more land, to broaden farming operations. It will be much better for the mass of farmers to improve their present holdings to the extent of doubling their productive capacity, by thoroughly underdraining them—the cost will be much less, than to buy more land and continue to farm the whole without this important improvement of soil conditions. Besides, in this way, the farming business will be so intensified as to lead to an intelligent uplift all along the line of its operations.

There are many notable examples that point the way to certain success, along the line indicated. If the man who causes two blades of grass to grow where only one grew before, is a public benefactor—the man who underdrains his land and causes two bushels of grain to grow where only one bushel grew before is a greater benefactor, but many have surpassed this high degree of usefulness, in the world's great work by growing maximum crops on underdrained land where none grew before. Yet there are millions of acres of the best agricultural lands, that need to be reclaimed by underdrainage, and thus add to the productions and the wealth of the country. The future outlook for agriculture in this country was never so promising as it is today. Our government has consuls and agents in almost every trade center throughout the civilized world, negotiating trade arrangements for the products of this country. There are men standing today in our principal markets ready to buy for exportation if we have what they want. Our exports of the past year aggregate over $1,500,000,000 and we are short on many products. Out of the corn production alone we have now as many as 70 different commercial products finding a market at home and abroad.

The foreign demand wants our horses, our cattle, and in short, all the products of our animal industries, our grain products, to say nothing of our manufactured products. May we ask where all these animal and grain products are to be grown to supply this world's increasing demand already at our door? There is but one answer to the question, and that is, that it must be produced largely in the great corn belt of our own country. We are today practically in the center of the "corn belt." In view of this coming prosperity, is it not imperative that we haste to put our soils in the best possible condition to grow maximum crops—that we may share alike the profits that will accrue from such an unprecedented trade.

The underdrainage of much of the cultivated land within the area of this great corn belt, is the base to build upon for the best soil improvement, and the best crop growing and the farmer or landowner with a business suit on, will not neglect to see to it that this basic improvement is made, and thus increase the productive capabilities of our wonderful soil possibilities. The world's needs are pressing and demands haste. (Applause.)

General Discussion.

President Heafer: Mr. Mamer, what have you to say in the discussion of this paper.

Mr. Mamer: I think the paper completely covers the ground. Mr. Billingsley has evidently given the subject so much thought and study that I think discussion, at least on my part, is not necessary. I would like to hear from some of the older tile men present. Mr. Cowgill has been in the business about three times as long as I have.

Mr. Randall: He said yesterday something about 2,000 years. (Laughter).

Mr. Cowgill: Not quite that long. I simply wish to say that I have given this business a study and have been absorbing from Mr. Billingsley ever since I started. I first made his acquaintance in 1878, during the organization of the Indiana Tile Makers' Association. For me to undertake to entertain you along this line would be impossible, but I would like to say that the tilemakers to-day are much more up-to-date than they were at the time I first began to study this business in the line spoken of by Mr. Billingsley. The question was then to get the water off the ground; to get the ponds off, and to get rid of the mosquitoes and the ague. That has all disappeared, and you do not see in passing over the country the need of underdrainage as apparent as you did twenty-five or thirty years ago. Then it was necessary to get men together and talk drainage to them. The farmers did not read the trade journals they do to-day, and you had to get them together and pound it into them. I remember one time I arranged for a meeting, and had Mr. Billingsley come and talk to them, and I made an offer that the man who would report the best bushel of corn on a certain day I would give a premium of $25.00 in tile. On the day set we had an exhibit of 30 or 40 bushels of corn. Mr. Billingsley was there and made a talk, and I think I sold more tile the next year than I ever had before. Things are different now. You do not see the great ponds standing in the fields that you did then, land is too high. There is a higher education for the tile maker to give the farmer to-day than there was then. It is not how to get the water out, but how to get the water into the land, and to understand that the tile are not for the purpose of draining all the water out, but in the dry times to give the plants the water they need by drawing it from below and feeding it to the plants. This is the education we have to give them to-day.

President Heafer: I heard Mr. Billingsley talk a great many years ago, and used to be very well entertained by him, and was just as well entertained by him to-day, and I think Mr. Whitney ought to have this printed in pamphlet form to send around for distribution, and the other tilemakers could use it too.

Secretary Stoll: The next number on the programme is a paper "Waste Heat Drying" by F. W. Butterworth, Danville.

Mr. Butterworth: Before commencing on this paper, I want, on behalf of the brickmakers of Danville, to extend you all an invitation to visit all our plants at any time you see fit. You can reach all of them by trolley. Mr. Selley's plant is first, then Mr. Shea's and the last is our own plant, that of the Western Brick Co., about two miles or two miles and a half out. We would like to see you out there at any time, and will do our best to make the trip pleasant, if we cannot make it instructive.

WASTE HEAT DRYING.

By F. W. Butterworth, Danville, Ill.

During the past two years there has been made a very notable addition to the English literature upon clays and the working of the same. Written in German, the wonderful contributions of Herman Seger, the result of exhaustive scientific research, were beyond the ken of all but a small percentage of American clay workers until the Ceramic Society undertook their translation. The two volumes, consisting of over 1,200 pages, are now on the market, translated by members of the society without remuneration, and if any clay worker is in trouble his difficulties must be very serious indeed if a careful study of these volumes will not smooth them away.

In the following hastily prepared paper I have borrowed very freely from Seger's essay on "Theoretical Considerations of Drying in the Open Air and in Closed Dryers," Page 251 of Volume 1, and if a manufacturer will carefully study that essay he will be thoroughly conversant with the fundamental principles of drying, which, no matter what method is used, are the evaporation of water and the carrying away of the resulting vapor.

President-elect F. W. Butterworth.

Evaporation of water takes place at all temperatures above that at which it freezes, but the higher the temperature, within certain limits, the more rapidly is this accomplished; hence heat is the first consideration in drying. The atmosphere has the quality of picking up certain quantities of vapor and carrying it away, and, as the air is one of the few things given the clay worker without cost, it is good business to use it. Hence for the drying of clay wares we must provide, first, a method for the generation of a heated atmosphere; second, an economical way for the handling of this heated atmosphere, both before and after saturation, commonly called circulation; and, third, we must study the relation of the heat to circulation in order to obtain the result as rapidly and economically as possible, consistent with the safety of the product.

The generation of heat with which to dry can be accomplished by utilizing that of the sun—open-air drying—artificially by radiation from either steam coils, called steam drying, or by direct radiation, called hot-air drying, or by utilizing waste heat, by which is meant the heat given off from the ware during either the burning or cooling process. The secretary has spared you any discussion of the former methods by limiting me to waste heat, for which you should be duly grateful.

Several attempts have been made to utilize directly the heat remaining in the gases of combustion after they have passed through the burning ware by forcing them through the ware to be dried, with, we understand, but indifferent success. Coming back to the first principle of drying—that is, a heated medium for the evaporation and carrying off of moisture—we find that in taking the smoke and products of combustion directly through the dryer that we have the temperature, but we have no dry-heated atmosphere, as this atmosphere is already charged to very nearly its full carrying capacity with not only the moisture from combustion, but with various other products from both the fuel and clay, so that it is incapable of carrying off much more vapor than it already has in its clutches; so to speak, in fact, experiments have demonstrated that, instead of carrying away vapor, these gases have a tendency to deposit some of their load upon the surfaces of the ware to be dried.

It seems, then, that the only practical way of using the heat from a burning kiln prior to its escape to the stack is by radiation; that is, by allowing these gases to come in contact with a conducting substance, which will communicate this heat to air, which will in turn be passed through the ware to be dried. This method is in use in connection with a few continuous kilns in this country, and is used extensively in the older countries, principally, however, by putting a drying room on top of the kilns.

The use of the heat given off from the cooling ware for drying is a large advance toward continuity in the manufacture of clay products, and with conditions right for its use is one of the greatest improvements ever made in brick making. Conditions for the generation of a dry-heated atmosphere of maximum carrying capacity are ideal. The kiln is full of ware, so arranged as to allow of a free circulation (it has to be set open to be burned), which is at an initial temperature of over 1,500 degrees, the generation of fuel gases has stopped, and fresh, cool, pure air is being passed through, warmed and picking up nothing but heat, which in this case is a bi-product which the manufacturer is anxious to get rid of at the earliest safe possible moment. I believe it possible to utilize 30 per cent. of the entire amount of heat used in burning in this way. That is, if a kiln requires 100 tons of coal in burning I believe it possible to use sufficient heat from the cooling kiln to equal thirty tons of coal burned in generating heat in hot-air or steam drying.

As to the best method of taking this heat from the kiln, whether top, bottom or sidewise, I do not believe there is much or any difference. The natural travel of heated air is upward, and if the dry house were situated above the kilns it would surely be the best to take the heat from the top, but in every instance the heated air is made to travel at least horizontally and nearly always down grade, so there can be but little difference whether it is taken down at the kiln or nearer the dry house.

As to the damage of cooling too rapidly, it has been the experience of every one using waste heat that there is less danger than by natural cooling, which is but natural. When a kiln is burned off temperature, we will say, is about 1,800 degrees; the outside air is at, say, an average of 65 degrees; this difference causes an immense draught, which gradually becomes less as the two temperatures approach. Result is a very rapid cooling for, perhaps, the first twelve hours, which gradually becomes slower and slower. With a fan running at a uniform speed practically the same amount of air is being passed through the ware every minute of the cooling process, and, although this is accomplished in, perhaps, 25 per cent. less time, the result is obtained through not a more rapid rate of cooling, but through a slower but more uniform rate.

We have now an ideal method of creating a clean, fairly dry, heated atmosphere. The next question is how much of that atmosphere do we require to accomplish certain results. By weighing green brick and dried brick we find a difference usually of about 1½ pounds, which obviously is the amount of water from each brick to be evaporated and carried off. If a plant is making 100,000 daily, 150,000 pounds, or 75 tons, or 18,000 gallons of water must be disposed of every twenty-four hours. How much study would we devote to the economical handling of seventy-five tons of sand were it found necessary to be used in the manufacture of 100,000 daily?

The amount of air required to pick up and carry off a given quantity of water depends, first, upon the temperature of the air; second, upon its velocity or speed at which it travels through the dry house; third, upon the accessibility of the material to be dried to this heated medium, and, fourth, upon the initial humidity of the air prior to being warmed.

In utilizing heat from cooling kilns for drying, particularly if the burning is done in small units and plant is running steadily, there is no difficulty in applying air to drying bricks at any reasonable temperature. This temperature is usually in excess of the requirements, and is reduced by the admixture of cold air prior to reaching the fan. In determining, therefore, the most economical temperature but one thing must be taken into consideration—the safety of the product.

The maximum temperature which can be maintained in a dry house full of moist brick is the boiling point of water, 212 degrees. Even if the air is admitted at considerably above that temperature, so long as there remains any water in the brick it will be immediately reduced to this point. This is due to the enormous amount of heat which is consumed in transforming water into steam, and which is called "latent heat." As soon as the first few carloads become dry then the temperature will increase to almost that of the hot air prior to its admission, but not until that time.

About one and one-third cubic yards of perfectly dry air, at 158 degrees, is capable of carrying off about seven ounces of water; at 176 degrees ten ounces, but at 212 degrees the same quantity is capable of carrying twenty-one ounces. If the same ratio of increase in carrying capacity were maintained this same air at 212 should only carry off sixteen ounces; hence, provided the clay will stand rapid drying and high temperatures, there can be no question as to the economy of admitting air at a sufficiently high temperature to maintain the dry house at its maximum, or 212 degrees. It would seem a simple matter, figuring from the foregoing, to figure the quantity of air, at 212 degrees, to dry 1,000 brick, each having one and one-half pounds of water in it, as, according to the above, one cubic yard of air is capable of carrying off, in round numbers, one pound of water, which would be 1,500 cubic yards for 1,000 brick each twenty-four hours, or one cubic yard per minute. But we have to take into consideration that the air, when first taken into the cooling kiln, is saturated to within an average of 80 per cent. of its carrying capacity. Again, this air cannot be charged to near its capacity owing to the velocity at which it travels, and also to the fact that, hack these brick as intelligently as we may, the air cannot get to them all alike, and also owing to the decrease in temperature of the air as it comes in contact with the cold, increasingly wet brick as it travels through the dry house.

From our own experience we believe it not safe to figure less than twenty-five cubic yards of air per minute at 212 degrees for each 1,000 brick to be dried in twenty-four hours, and forty would be better; hence for a plant making 100,000 daily the fan must be large enough to deliver from 100,000 to 150,000 cubic feet of air per minute.

In the drying of 100,000 daily 150,000 pounds of water must be carried off, or 100 pounds per minute; hence the air in its passage becomes heavier by just that amount. From this fact comes the argument in favor of short dry houses for waste heat and of exhaust fans, as the heavier the air becomes by reason of its saturation the more sluggish becomes its movements.

John W. Sibley, Birmingham, Ala.

It seems that this saturated atmosphere should be taken out of the top of the dry house instead of the bottom, as, although it has certainly greatly increased in weight, yet owing to its comparatively high temperature as compared to the outside it still has a tendency to rise.

Again, the most economical and rapid drying will be accomplished, always providing the clay will stand it, the more nearly the temperature of the exhaust atmosphere approaches the boiling point of water, because then the heated medium will not only retain in suspension all the moisture it has picked up, but will be taking up some all through its travel until exhausted.

The circulation in a waste heat dry house must of necessity be accomplished by some mechanical means, the long distances the air travels, the various necessary turns and the high velocity owing to the small size of the ducts cause such a frictional resistance as to preclude use of natural draft. If the house is short and saturated air escapes at top good drying may be done with but one fan, but I believe better would be done by using exhaust fans in connection.

From a theoretical standpoint, by carefully watching the relations of temperature and circulation, it seems that this method should be eminently practical, even if the clay to be dried were of a very tender nature, but, of course, a decrease in temperature would naturally result in slow drying and a corresponding increase in circulation.

Along the lines of practical construction there is no chance for argument as to the ultimate advantage of making the dry house fireproof. The heat ducts should be of ample size—the larger the better—and the avoidance of crooks and turns will decrease the frictional resistance, which, when air is traveling at the rate of from twenty-five to fifty miles an hour, is considerable.

The uniform distribution of the heated air in the various tunnels of the dry house from the main duct can be accomplished successfully by having the total area of the openings to the tunnels a trifle less than the area of the heat duct, thus insuring a slight pressure in the latter, which in turn insures the last opening getting all the air it can take, as well as the one nearest the fan.

The corrosion of steel cars, owing to the high saturation and temperature, is frightful, and must be taken into consideration in considering its ultimate economy. Also, a shut-down of two or three days usually means a period of wet brick ten days or so from that time, owing to the scarcity of heat, kilns not being filled and a gap resulting which it is difficult to bridge over.

In many manufacturing processes the profit is made by utilizing bi-products, and the use of waste heat is along these same lines. It is eminently practical, and no progressive brick or tile maker can afford to pass it by without investigation. [Applause.]

General Discussion.

President Heafer: Mr. J. W. Sibley of Birmingham, Ala., who for many years has been treasurer of the National Brick Manufacturers' Association, is with us, and we would like to hear from him on this subject.

J. W. Sibley, Birmingham, Ala.: Mr. President and Gentlemen of the Convention: It is certainly a pleasure to me to meet with you, many of your faces are familiar, having met you at the National Conventions. It is very little I could possibly add to what Mr. Butterworth has said in his paper. We have had about three years experience with waste heat system of drying brick at the three different plants of the company of which I am general manager, one in Alabama, one in Tennessee and one in Virginia. I first put the waste heat system in at the Alabama plant, and those of you who were at the convention at that time will remember a paper I read on the subject. Last year we installed the system in the plant at Tennessee, and this year, at the Virginia plant, and I must say from the experience we have had at all three plants that we have had the best results from the overhead system at the Coaldale, Ala., plant. At the Robbins, Tenn., plant, we have the under ground system connected with the main flue through the center of the kiln. At the Virginia plant, we have the connection made through the doors underground. An opening is made in the casing after the kiln is closed down, where the brick are drawn, we put a hood over the opening, and it is then connected with the flue, and we get better results than we do from the underground system at Robbins. The trouble at the Robbins plant is the great presence of moisture in the ground. The plant is situated in the valley, and we have to store our water in the winter time for the dry season and I think there is some steam in the underground conduits. But the other points brought out by Mr. Butterworth in his paper certainly gives the experience we have had, specially as to the degree of heat and the use of the exhaust fans at the cooling end of the dryer to take off the heavily laden atmosphere. We treid the plan at Coaldale first, just using the stack with natural draft at the cool end of the dryer, with moderate success. At the Tennessee plant we put in exhaust fans, and it proved so satisfactory that we adopted them at the other two plants. We have found it a great matter of economy in the amount of fuel used at our plants. We formerly had steam dryers, and the amount of steam used at our boilers in consequence of cutting out the steam dryer has been reduced about 50 per cent.

Mr. James Van Inwagen, Jr., Momence, Ill.: I would like to ask Mr. Butterworth whether it would not be practical with a continuous kiln. We have a continuous kiln and exhaust part of the heat before it leaves the kiln—perhaps 200 or 300 degrees of heat. Would it be practical to use that up to 300 degrees to dry the brick?

Mr. Butterworth: The only way would be to utilize the products of combustion, and they are so heavily charged with sulphurous gases that I doubt if it would do much good.

President Heafer: I see Mr. L. E. Rodgers in the hall, and I believe he would rather talk on this subject than eat.

Mr. Rodgers, Chicago: I think Mr. Butterworth has covered the ground, but I would like to ask him what he considers the right length of tunnels.

Mr. Butterworth: Those of you who visit our plant this afternoon will see that we have not conformed to everything I have said in that paper. The paper was written after the dry house was built. (Laughter). Our tunnels are 125 feet, and I believe for the best results in waste heat drying, provided your clay will stand it, your tunnels should not be over 65 to 75 feet. I think the whole thing is summed up in this—the quicker you can take your heat out of your dry house, that is, the quicker you can take the charged atmosphere from the dry house, the faster you are going to dry your brick. If you admit air at 350 degrees it immediately is reduced to 212 on account of the wet brick it passes over. If it has to pass through too many wet brick, by the time it gets to the end of a long dry house, it will have deposited some of the moisture it has picked up in the front end. Consequently, the shorter you get your dry house in order to maintain that temperature, the better results you will get. That is my theory. I have not had time to put it in practice, I have seen some of the faults of long dry houses.

Mr. Sibley: That probably explains why we are getting better results at Coaldale. It is probably due to the short dry house rather than the overhead system.

Dr. Converse: The term "waste heat" has got to be a misnomer. It is not waste heat at all. We are simply utilizing all our heat, we used to waste it. I think there has been no improvement in the manufacture of brick, not relating to the making of brick themselves, that has accomplished more for the brickmaker than this system or process of drying with the heat from the kiln. Mr. Sibley has been using it three years, and still he does not seem to know as to the exact reasons for the process working better in one plant than the other. We have but the one system, that is the underground system, and our conduit is dry all the time, so we are not troubled at all with moisture. I have an idea, I don't know whether my theory is correct. We have down draft kilns, and I think the heat having a tendency to go to the bottom all the time, we hold the heat on our lower courses where we want it better and longer by drawing the heat from the top down through the bottom of the kiln. We certainly are making better brick than ever before. I imagine by the process of holding the heat and annealing these lower brick in getting the heat off that we get better and tougher brick. We mix the air with our heat. We have not been able to empty our kilns any faster than we did before. I was afraid at first that we would cool our kilns too fast—I anticipated some trouble and danger in that respect, but we do not cool our kilns any faster than we did before. We take from six to seven days to cool a kiln, drawing the heat from the top down. We used to be bothered more or less when we were using a steam tunnel dryer by having the brick blister and since we have this process our brick are not blistered at all, and we are far freer from whitewash than ever before. I am satisfied it is the correct way, the chemical way to dry brick, and we are but utilizing that which we have already made.

F. W. Plumb, Streator, Ill.

Secretary Stoll: Mr. Inwagen asked a question as to utilizing the heat from continuous kilns. Mr. Rodgers has just installed that sort of a system for Burnham Brothers at Milwaukee, using the heat from the continuous kiln, and he can tell you how he takes this heat out of one kiln and puts it into the other chambers.

Mr. Rodgers: It has not been thoroughly tested as yet. It has just recently been finished, they have not got their continuous kiln in operation. Probably by next convention, I can tell you about taking waste heat from the continuous kilns, but it is more or less of an experiment at the present time, but I think it will be successful.

Mr. Robb: Mr. Butterworth threw out one hint that I would like to ask further about. That is, in regard to the sulphur or sulphurous gases and its effects on the dryer cars and also upon their dryer structure. Necessarily, we have some iron in the roof of our kiln, and dry houses, and the cars of course would be entirely of iron. I would like to ask someone as to the loss, or the expense account, or repair account. Our coal is very largely impregnated with sulphur. It seems to me it would be very deleterious to the cars, as well as the roofs of the dryers. We have had no experience with these waste heat dryers, but like everyone else, we are thinking of it.

Mr. Purington: We have never had any trouble with our kilns by rusting or corroding of the cars at all since we put in our waste heat system. Previous to the installation of the waste heat system, we used the steam dryer, sent the heat directly through our dryer, and I think six months would have spoiled every car that we had. With the waste heat dryer there is none of that at all. Some twelve or thirteen years ago we built a dryer eighty feet long, and we are now making it longer. At least, I was going to, but now I will think it over. One half of this dryer twelve years after it was built had to be built over. The T irons 1¼x1½x3-16 were entirely destroyed in the back half of the dryer, and we had to replace the iron last year. The front half or hot end of the dryer was just as perfect as when it was built. It was the dampness which caused the rust on the iron. We use the overhead system in the waste heat process, and our dryer will last a long time. In regard to this length of dryer. We have built a good many dryers and have had rather fixed ideas in regard to the length, having made them all 84 feet long. I think it would depend somewhat upon the velocity with which the air traveled through the dryer as to whether a short or long dry house was best. We are putting in a 180 inch exhaust fan in a nineteen track dryer, putting a ten foot flue across the end of the dryer. We intended to increase our dryer from 84 feet to 180 feet. This would enable us to put 38 more cars in the dry house, and these would be warming up, or at least, we think they would be in better condition to dry, having been in the lower end of the dry house. I may be wrong, but I think the velocity with which the air is carried through brick has more to do with it than the length of the dry house.

Mr. Eudaly: I want to ask Mr. Purington, in regard to this dry house, where he had to replace the T irons that had rusted, whether he had the exhaust fan in the stack or whether he had it across the tunnel at the cold end of his dryer.

Mr. Purington: We have used and are using now, a four inch one disc fan in our stacks.

Mr. Eudaly: I think if Mr. Purington had tried it in the tunnel across the cold end of his dryer, he would have obviated that difficulty.

Mr. Purington: I very much doubt being able to keep the dampness out that way. I am willing to gamble a little on that. (Laughter).

Mr. Eudaly: I am not in the habit of gambling, but I would advise someone to try that. A great many things will be doubted until they are actually tried. Experience is a good teacher.

A Member: Yes, and a dear one, too.

Mr. Butterworth: The question of the length of the dry house seems to be one of the propositions Mr. Purington wants to have discussed. I can't decide it for him, but I firmly believe in the short dry house for waste heat. The question of the velocity of the air has a great deal to do with it. I understand in addition to putting in a large exhaust fan, he has also doubled the capacity of the fans at the front end, and by putting in twice the amount of air, naturally it will travel twice as fast through the dry house. It may be with a tunnel 100 feet long it would do much better work than with the dryer 84 feet long. The question of the rusting of cars has been brought up by Mr. Robb. I do not know, but I think the question will eventually be solved by using cast iron cars. We have found that wherever cast iron is used, there is no corrosion. Wherever we use steel it goes to pieces. Wrought iron is very fair, but I think that cast iron is better.

Mr. J. G. Shea: We have a hot air dryer constructed on the same principle. We intended to use waste heat, but never got at it. It was built for that purpose. We are using hot air furnished by furnaces. Our cars have been used twelve years and they do not show any signs of wear. They are cast iron cars.

Mr. Pratt: I would like to ask Mr. Purington what kind of a roof he had on his dryer, and if the construction of same did not have something to do with the rusting. That is the method of construction?

Mr. Purington: No. The roof was constructed of T iron, 1¼x1½x3-16, laid eight inches apart, brick placed between the irons and covered with three inches of ground clay, after being thoroughly grouted with wet clay.

Dr. Converse: I note that Mr. Purington is using double fans. We only use one fan, and we have no trouble drying our brick. We dry them bone dry in 24 hours, and carry the air off with a stack at the other end. We have a 12 foot fan. Our stack is about 20 feet high and we have found no occasion to make it any higher. Our dryer is 116 feet long.

Mr. Butterworth: Of course, this is a good deal like calling in a physician when you are sick. You get well. The question is how much sooner did you get well than you would if you had not called in the physician. This is no reflection on Dr. Converse, but how much better drying would you do if you had a fan in your stack?

Mr. Sibley: We built our dryer at Robbins, Tenn., along the lines Dr. Converse mentions, and we could not get any dry brick at all. (Laughter). We had to put in our exhaust fan.

President Heafer: This is an interesting subject, but we will have to pass it, and take up the next.

Secretary Stoll: We have with us today, Mr. Wilder, from the State University at Champaign. The State of Illinois is making preparation to have a clay exhibit at the Louisiana Purchase Exposition, somewhat after the fashion of the exhibit we had at the Chicago World's Fair. Mr. Wilder will explain this feature. The idea is to have some raw material from different parts of the State. Some products in the green state, and some burned—that is ware manufactured from these same raw clays. This is not to go against any exhibit which may be made by the rest of the United States, but it is to be a separate one, just from Illinois, and I presume some of you will be called upon to make a little donation of some clay and a small piece of the green ware, and a small piece of the burned ware to be put in this Illinois exhibition. I have a resolution which has been drawn up and which I will read.

MR. WILDER'S RESOLUTION.

The Illinois commission to the Louisiana Purchase Exposition, to be held in St. Louis during the present year, has made an appropriation for an exhibit of the mineral resources of the State, and desires to include a display of the clays, shales, etc., of the State, together with the products manufactured from same.

In order to insure the success of this feature it is desired that the Illinois Clayworkers approve of the work and lend such assistance as may be possible, both by suggestions and advice. It is understood that the expense of such display is to be borne by the Illinois commission, and the active work carried on by Mr. Charles T. Wilder, the superintendent for the general exhibit of mines and mining, and the display to be a part of exhibit in the mines and mining building, now being arranged by the commission. In order to present the matter to the convention

Be it resolved, That a committee be appointed by the president of the association to co-operate with the Illinois commission in the work of making an exhibit of the clay industries of the State, said committee to outline a general plan of exhibit which can be followed, and also assist the commission by suggestions and otherwise, as occasions may demand.

M. C. Meigs, LaFayette, Ind.

Secretary Stoll: Now, Mr. President, I move the adoption of the resolution.

Seconded by several.

Mr. Wilder: There is nothing much to say in regard to this resolution, except that we hope to get an exhibit typical of the clay industries of the State of Illinois. We want it to form a part of the Illinois exhibit, not to be run against the exhibit going to be made under the direction of Dr. Holmes in the Mines and Mining Building, but is to be on a much smaller scale, just to show the clays and clay idustries of the State, and we are prepared to bear the expense of the installation and maintenance, and if I could have a committee of say three of your members that I could feel free to consult and correspond with, ask for suggestions, etc., it would help me out a great deal and it would also put the stamp of your Association upon the exhibit, and beyond that there is nothing more to say now. It would not involve much additional labor on the part of the committee, but I could go to them when I wanted advice and assistance. We will bear all the expense incurred and give the exhibit a permanent place afterward at the University. This exhibit, you understand, is not to run counter to the big show, but to be a feature of the Illinois exhibit.

President Heafer then put the motion on the adoption of the resolution, and it was carried.

President Heafer: I will appoint as the committee Mr. Wilder asks for, W. S. Purington, Galesburg; Dr. A. L. Converse, Springfield; J. M. Mamer, Campus, Illinois.

Mr. Purington: It is only a little trouble to send a few brick or a few tile, or whatever asked for, and I think we should all respond when we are called on. It is something we are all interested in, and we want this display to be just as good as we can possibly make it, and I think we should all use our best endeavor to make this exhibit as fine as we can. You will all of you receive circulars, if you have not already done so, explaining what will be required, and I hope you will all make an effort to meet the requirements.

President Heafer: The next on the program is entitled "A Few Thinklets," by M. C. Meigs, Lafayette, Ind.

Mr. Meigs gave in an entertaining way an account of a most enjoyable trip to the Pacific Coast. It was a pretty word picture interspersed with poetic quotations, and was listened to with marked interest.

President Heafer: Presume there will be no discussion on this topic, so we will pass on to the next, "Power Generation for Brick Plants," by John T. Thompson, Chicago.

Mr. John T. Thompson: I seen on looking at the program that I have a handle, C. E., which may stand for Clay Expert, and I do not know very much more about clay than I did when I was a kid and used to play hookey. The only thing I ever played hookey for was to steal over to old Mr. Blair's brickyard at Cincinnati, and see the old horse pull the wheel around in the tempering pit. I am not a civil engineer, except to be civil, then there is consulting engineer, but the Chicago directory has Contracting Engineer, which is about right. According to promise I have prepared a paper which I will read.

POWER GENERATION FOR BRICK PLANT.

(John T. Thompson, C. E., Chicago, Ill.)

We hope no one will assume from the title of this paper that it is to be technical in any sense, for it is not to be.

We believe in the value of theory, and its importance in connection with practice, but at the same time do not believe in the technical treatment of theory as practiced by many writers. In other words, we believe it possible to so present a theory as to make it clear and intelligible if not to everyone, at least to those having practical and working knowledge of the subject.

The criticism is often heard that a paper treating of a subject with which the critics were familiar, that, at the time of writing, the writer may have comprehended its technics, or thought he did, but when the ink was cold he did not.

But it is the practice, and, in our opinion, altogether to common, this method of treatment of subjects.

We shall say a few things about the boiler and engine, and the boiler and engine in the brick plant.

It has been always a mystery the little attention the steam-making part of the manufacturing plant has received. 'Tis true that in recent years some manufacturing lines have been giving this department much more consideration than ever it received before. Doubtless every one of you can recall visiting new manufacturing plants and being shown the latest designs of the machines, thoroughly modern, automatic in action, each exceeding many times the output of the older design; in short, everything in sight indicating the best of its kind to be had, and for what reason?

That an increased output may be had at a reduced cost; that the production of material for the markets may be effected along the most economical lines.

So far, so good.

Having seen the factory and its tools, you ask to see the engine room.

You are led off to one corner of the building, or, perhaps, into the basement or some other out-of-the-way place, and there, in cramped quarters, you will find the boiler and engine. From the limited space allowed for this end of the business (and appreciating its relative value), at the moment you would be justified in thinking that the ground occupied was as valuable as that piece of ground corner State and Madison, southwest corner, which was sold recently for $30 per square foot, or over $1,300,000 an acre! But no! It was not the value of the ground of its site, but the truth was the idea prevailed "that any old place would do." (we have had men tell us that), and, of course, understanding this end of the business, there wasn't much consideration given the boiler or engine.

But, as we have said, in some manufacturing lines there has been considerable improvement—the managers and owners having learned from experience that something was lacking; the modern machines and tools they had were doing their work faithfully, still, when the balance sheet was taken off the net profits were not satisfactory—the expense account had all but used up the gross profits. And, after going through the entire plant, at last reaching the boiler room (visited last because regarded least important) they found where some improvements might be made; and they went deeper, and soon realized that had they given as much consideration to this department as they had to the machines and tools and installed economical steam-making devices or appliances, they had experienced no trouble in making the desired profit out of the business.

Now, we regret to say that it is the exception, and not the rule, with owners of brick plants to give the power-generation end of these plants much consideration.

We don't wish to be understood as saying that a cheap boiler and engine go in, in the same sense of their being worthless and unsafe, and the only consideration given being cheapness in price. No, not that, but that anything in the shape of a boiler or that looked like an engine is bought and installed; and, further, where they go is regarded of no moment—in other words, they are not properly housed. (Of this we shall say something hereafter.)

But this cannot be said of the machinery for brickmaking. We have visited many plants, and were impressed with the high grade of the various machines used in brickmaking. The mixers, grinders, and, whether soft or stiff mud, or pressed brick machines—and the kilns—in short, everything pertaining to brickmaking, evidence the fullest consideration and the choicest selections of the types best adapted to the clay to be worked, and no expense had been spared to obtain the best money could buy; but, on looking over the power-producing end, the contrast was so great as to excite comment—silent, of course, for to have voiced it had been exceedingly discourteous to our host, if not an insult to him.

Yet, we have said already it has been always a mystery to us why this has been the practice.

We now come to the boiler and engine. There are boilers and boilers, and engines and engines. But there is a great deal of difference between boilers, as there is also a great deal of difference between engines. And this difference amounts to this: Some types of boilers will evaporate only five pounds of water with one pound of coal, and others again with one pound of coal will evaporate ten and twelve pounds of water. Now, assuming that with a type of boiler evaporating but five pounds of water to one of coal and your engine is of a type (and it is in common use in brickyards) requiring sixty pounds of steam per horse power hour, and the engine is developing fifty horse power, the consumption of fuel per hour is six hundred pounds, and in a run of ten hours a consumption of six thousand pounds, or three tons, practically.

If coal is worth, say, two dollars a ton, the fuel bill is six dollars each day, and if the plant runs three hundred days, there is a total coal bill of $1,800 for the year. Or, if the boiler is of a type evaporating ten pounds of water per pound of coal, and the engine used is of the automatic type, requiring only thirty pounds of steam per horse power, the coal consumption is three pounds, or 150 pounds per hour, developing fifty horse power, or fifteen hundred pounds—three-quarters of a ton—consumption in ten hours, at a cost of $1.50 a day, or $450 in a run of three hundred days—a saving in the coal bill alone of $1,150, a saving in changing from one to the other of about 72 per cent., or equivalent to an income that would result from an investment of $23,000 at 5 per cent. per annum.

J. T. Thompson, C. E., Chicago, Ill.

But you will say that the first cost of such an outfit is greatly in excess of the other! Granted. Let us see what this is.

Roughly estimating it, we shall assume its cost as twice that of the other, or to reduce it to figures, the one will cost $1,600, against a cost of, say, $800.

The saving in fuel alone will pay not only the difference in the first cost in one year, but yield besides a return on the original investment of about 22 per cent., or, to put it in another shape, it will pay 6 per cent. on the original investment, 5 per cent for depreciation, and over 10 per cent. to go either into a surplus fund account or to profit and loss. Of course, if fuel costs less that two dollars, the net gain will be reduced, but, on the other hand, if fuel costs more than two dollars, the saving steadily increases.

And where fuel is high priced there are other devices which should be employed.

We refer to heaters, oil or stem separators; the covering of steam pipes. In this connection we must refer to the housing of boiler and engine. You would think, in looking at some plants, that the owners regarded the boiler and engine as not requiring any protection from the weather, whereas the fact is they should be housed with such care that at all times the engine and boiler room would be perfectly dry, and the walls so closely built that there would be no heat losses by radiation and no openings admitting cold air currents from the outside.

You are ready to say that this adds greatly to the first cost of installing the plant—this is true—yet it can be proved easily that the gain in thus protecting your steam plant will be such that it will soon pay for the increased first cost and thereafter earn a profit, and, even if this is not easily determined, you may be assured you are not suffering any losses from waste which are unavoidable where this protection does not exist, to say nothing about the unseen deterioration of your plant which otherwise would be going on by day and by night, year in and year out.

We have referred to covering the steam pipes, the object of which is to prevent the escape of heat, and reduce the condensation of steam and accumulation of water in the pipes as much as possible.

While carefully conducted experiments give different results, we find that good authorities agree that one four hundred and twentieth part of a pound of steam was condensed for each square foot of surface per hour, for each degree difference of temperature, hence the rule: Multiply the number of square feet exposed to the air by the difference between the temperature of the air and steam, and divide the product by 420.

By way of illustration, and without going into details of the calculation, take a six-inch pipe, 150 feet long, carrying seventy-five pounds of pressue in air whose temperature is 50 degrees Fahrenheit, the loss would be equal to 164 pounds of steam condensed per hour, and if the boiler evaporates eight pounds of water per pound of coal burned there are 164, divided by 8, equal to 20.5 pounds of coal, lost per hour, or 205 pounds per day of ten hours. But it must not be supposed that a pipe covering will save all this, as some will be condensed even then, but a good covering will reduce the condensation to about one-third of the above.

There should be some provision for heating the feed water on its way to the boiler, as pumping cold water into a hot boiler causes uneven contraction of the plates, bringing more stress upon them than would ever be caused by any ordinary pressure. Besides the saving in coal with a non-condensing engine, advantage should always be taken of heating the feed water by the exhaust steam.

In this way a saving of coal equal to from 10 to 15 per cent. will be effected, and, as has been already said, it is much better for the boiler to feed hot water.

The exhaust steam from the engine should pass into an oil separator on its way to the heater, in order that the cylinder oil may be extracted, because it is not needed, neither is it wanted, in the boiler.

Another thing is the proper "bricking in" or setting of a boiler. The best work of this kind we ever saw was at a place where common brick cost $12 and the fire brick $40, and the poorest we ever saw was in a brickyard —where there were a half million brick stacked up—and on seeing it we thought of the old saying: "'Tis the tailor's child that is not clothed" and "'Tis the baker's child who goes hungry."

In conclusion, permit me to say that we do not flatter ourselves we have said anything with which you are not already familiar, and more than likely as well, if not better, informed upon than are we, but, having an opportunity, we could not resist taking the subject of power generation in connection with the brick plant as our theme, thus enabling us to say something regarding what, to our mind, has been, on the part of owners of brick plants, a serious oversight in not giving the steam-making end of their plants the fullest consideration and the installation by them of the best obtainable apparatus, and if what has been said shall bring about in the future more attention to and better provision for this department, we shall be more than satisfied with this, our slight contribution toward that much-to-be-desired condition, viz: The adoption by brick plants, whether large or small, the proved economical types of boilers, engines, heaters—in short, every known device that will reduce the cost of producing power to the lowest possible point, because it is in the power plant where profit is either made or lost.

I thank you, gentlemen, for your kind attention. [Applause.]

General Discussion.

Mr. Thompson: Before taking my seat I would like to give you one little fact. There is building in Chicago by the Electric Company, which is the successor to the Edison Electric Company, a large power house on 22d and Fiske street, on one of the slips of the south branch. That plant, when completed, will cost $8,000,000, that is the amount appropriated. I have the honor and pleasure of representing the company that is furnishing one item alone, that of condensers. The plant will be 130,000 horsepower, the largest power plant in the world. The next I think is the New York Subway power plant, which is 90,000 horse power. This plant will be divided into 13 units, each unit 10,000 horsepower. My company furnished the condensers. You all know of the condenser in connection with a steam engine in order to produce a vaccuum. Each of these condensers will cost $50,000. The Electric Company in building that plant will spend of the $8,000,000 appropriated, one-third for the steam-making and power producing end of the plant.

President Heafer: This paper has been so interesting, and has covered the ground so completely that I presume there will be no discussion.

Secretary Stoll: The next is a paper "The Burner," By Warren W. Ittner, Belleville, Ill. Mr. Ittner was unable to be here but he has sent his paper, which we will read for him.

"THE BURNER."

By Warren W. Ittner, Belleville, Ill.

We had occasion to visit the proprietor of a small dry-pressed brick plant in a nearby city, and on invitation we took a look over the premises. It is always the burns which are most of interest and as our time was limited we confined our attention to these.

The kilns were of the old Dutch type, twenty-three feet wide, forty feet long, with the brick set forty feet high. I may say that with slight alterations in dimensions the burner was also of the same type. This must not be construed as an attempt at disparagement, for we revere the old man. The burn he exhibited with pardonable pride would have won the enviable respect of any brickmaker. To judge by the face it presented—the kiln was about one-third empty—the burn was certainly a good one. It had possibly one course of good soft brick on top, medium red for a few courses under these, and the balance all hard and red. The even settle indicated uniformity throughout.

To forestall all inquiry, I will add that the old man is a stockholder in the plant. We expressed our admiration and he informed us that "The brick would be nicer if the clay was a little more civilized." We thought he meant pulverized. However, we didn't laugh—then. The old burner held our respect, and a lack of command of the English language by no means indicated a lack of knowledge of brick burning. Besides it would have been very foolish of us to have dammed the flow of information by giving offense.

He explained. The clay-gathering season had been rainy; they had run out of clay and were then hauling it direct from the field to the machine. The explanation cleared our minds. Old weathered clay to him was "civilized," while new clay fresh from the field was uncivilized. Not so incongruous after all. Now, all good burners are not necessarily old-fashioned Dutchmen, nor is the converse of this statement correct; but you will notice that a great many good burners are just the type I mention.

W. W. Ittner, Belleville, Ill.

Sons of a plodding, bread-baking nation they are, but continuing in the paths of their forefathers.

There is one description of a burner which all manufacturers will doubtless admit a concise and correct one. It is "Someone—anyone who can give me just the results I want." Our modern dictionaries are very unsatisfactory from some points of view. In fact, we are most of us willing to allow a liberal discount and accept as a burner one who can approach to within 25 per cent. of the par value of our ideal.

It is an easy thing to enumerate the essential qualities that a good burner should have, but to find an individual possessed of all of them is another thing. Of the essential qualities constant undivided attention is perhaps paramount, whether it takes the form of noting a pyrometer every half or quarter hour or to living with a kiln from start to finish, with no confidence in the night helper. All the knowledge in the world will be of little value if the time to apply it has gone by. Those of us who have tried a whack at it ourselves know what a jealous mistress a kiln in the critical stage of burning is. Again by watchfulness we acquire knowledge.

There is what would seem to be a sixth or intuitive sense possessed by the successful burner, which is born of long experience; or shall we merge this with the constancy mentioned above, together with the exact knowledge of conditions, causes and effects, etc? To be so intimately in touch with the progress of a kiln that its every phase or change is recognizable and indicative of something to follow or something to be done to guide its destiny—to do this certainly requires a knowledge not only of the conditions with which one is working, but also with a general knowledge of clay working and clay burning. To eliminate the guesswork is the idea, and science is rapidly aiding us in accomplishing this. However, just as in the other industries, the human element in the manufacture and burning of clay wares will never be eliminated, which is perhaps a fortunate thing for humanity.

The percentage of first class ware produced should be the sole criterion in judging the work of a burner; provided, of course, that fuel and time are employed with reasonable economy. The matter of cost does not enter into this phase of the question at all. The burner does not exist who can burn ware cheap enough for us. Chosing between two burners equally good in percentage of first class ware produced we would, of course, employ the one who made the best showing as to cost, but chosing between two burners one with a record of high percentage of perfect wares and correspondingly greater cost and one giving indifferent results with a low cost the market conditions or our consciences must decide. Saving in the cost of the ware at the expense of the quality usually proves to be a false economy.

The saddest failure a burner with prospects and ambition can make is to attempt to satisfy requirements as to time and cost incompatible with good burns even if allowed certain latitude in point of quality. He is always judged by the quality of the ware he produces and it is seldom he receives the commendation of his employer even after having met the latter's requirements—he certainly never receives any from those acquainted with his situation. The proprietor though satisfied with the showing of cost cannot help but believe that a better ware could be burned for the money—if the burner understood his business better.

Naturally a manufacturer making such conditions is forced to do so by his market conditions in which he has been placed by his own unwise choice of location or a change in the circumstances which governed the choice. Continual effort for betterment of product and cheapening cost taken together form a key to success, but to gain the latter at the sacrifice of the former is hardly justifiable.

We are all familiar with the innumerable reasons or excuses, burners are apt to offer where results do not meet expectations and it is up to the manufacturers to be able to separate the wheat from the chaff. Naturally it is hard to deceive the old timer who knowns pretty well what his clay and kilns are capable of, but is just a little shy on being able to do the thing himself. However, it pays even him to be watchful.

I know of an old established firm who were convinced by a gentleman calling himself a burner that he could eclipse anything in the way of a burner that they had to exhibit. He didn't call the things they were making burners at all. He was a very clever gentleman. He didn't begin by telling them what I have so far told you. That all came in his grand finale after he had let them down easy by expressing his surprise at certain results in consideration of the admirable kilns and very excellent equipment they possessed. Apropos he gave opinions as to the proper means of remedying certain minor troubles, but as for the grand and glorious secret of the whole thing, "well, he could show them."

He did—to the extent of three ruined kilns. It was a clear case of bunco, and as a tribute to the genius of its author I must state that he is operating yet, having convinced several other brick manufacturers that they lacked certain knowledge which he alone could supply. Now, this incident does not indicate imbecility on the part of the dupes; rather, it goes far to show the hankering of the average clayworker after knowledge and his willingness to be shown. It also illustrates the peculiar attitude of mystery, largely inherited, in which we are apt to hold the art of brick-burning and also the profound awe and respect we feel for him who claims to be a past grand master of the same.

In spite of all this, the manufacturer must realize that the burner has many different conditions and combinations of conditions to deal with and that things slight in themselves are apt to change a burner for better or worse. The location of kilns with respect to surrounding sheds and buildings, the direction and velocity of the wind, the state of the weather, the inefficiency of firemen, conditions of kiln walls and furnaces, variations in clay and fuel, etc., etc., are some of the more or less important causes which effect results in burning.

I know of a case where a burner—another oldfashioned Dutchman, by the way—seemed to be losing his hold on the kilns he had burned successfully for years. The plant had changed hands once or twice, but he, like the rivulet, seemed to go on forever. He had grown discouraged, when, after perhaps three months of poor burns, they decided to change the clay, when, lo! the difficulties vanished. The clay had changed gradually with the depth, leading the burner to believe that age was at last robbing him of his skill.

Science—slow marching—is shedding light where darkness has prevailed, and burners must be prepared to avail themselves of her guidance. The grimy-bearded man, looked upon as the seer and carrying his iron hook as the insignia of his office, must give way to the man of science, just as the ancient astrologer disappeared at the advent of the more progressive astronomer. It is merely a matter of evolution with scientific research as the chief stimulant. After all, we certainly cannot disregard the precepts of the old burners any more than we can those of the old astrologers, for it is the sum and substance of human experience which makes for our advancement. [Applause.]

President Heafer: We will now hear the report of the Committee on Resolution.

D. H. Jansen: Your Committee on Resolutions beg to submit the following:

REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. President and Gentlemen of the Convention:

Your committee wishes to report and move the adoption of the following resolutions:

First—That great satisfaction should be felt by the association at its steady growth of membership and the increasing success of each annual convention.

Second—That the thanks of the association be tendered to the officers for their faithful service during the past year.

Third—That the Danville brick makers be complimented upon their success as hosts.

Fourth—That we express our appreciation of the courtesy of the managers of the Plaza Hotel.

Fifth—That the association hereby expresses its sincere and grateful recognition of the faithful services rendered by G. C. Stoll for the past fifteen years as secretary, and assure him of our best wishes for his future success.

F. PLUMB, Streator.
W. S. PURINGTON, Galesburg.
D. H. JANSEN, Pekin.
Committee.

On motion, the report was accepted.

Secretary Stoll then submitted his bills for the last year, all of which were allowed.

Treasurer Hammerschmidt then read his report, showing the following receipts and disbursement:

O. W. Dunlap, Vice-President-Elect., Bloomington.

Balance on hand, acc't 1903......	$54.35
Received from Sec. Stoll, 1904..	89.00
	$143.35
Bills allowed and paid...........	97.30
Bal. on hand, Jan, 6, 1904......	$45.05

On motion, duly seconded, the report was accepted.

Election of Officers.

President Heafer: This brings us to the election of officers. Nominations are now in order for President.

Mr. J. G. Shea: I desire to place in nomination the name of Mr. Frank W. Butterworth, of Danville.

Mr. Randall: On behalf of the Indiana contingent, I desire to second Mr. Butterworth's nomination. He is really a Hoosier, and is now sojourning in Illinois. If you will look at your program you will see that out of the eighteen papers, about half of them were contributed by Indiana men. We Indianians are modest. We come over here every year and lend you our brains and energies and ask nothing in return. We are glad to be represented by proxy, however, and to have an ex-Indianian stand at the head of this Association for the ensuing year. (Laughter.) And I move that if there are no other nominations that the Secretary be instructed to cast the unanimous ballot of this convention for Frank W. Butterworth for President.

Motion seconded by Mr. Selley and carried, Secretary Stoll cast the ballot for Mr. Butterworth.

President Heafer: I declare Mr. Butterworth duly elected and will ask him to come up here. Gentlemen, I take pleasure in introducing to you our new President, Mr. Frank W. Butterworth. (Applause and cries of speech.)

President Butterworth: Gentlemen, I am no speechmaker. I simply wish to thank you for the honor you have conferred on me by placing me at the head of the Illinois Clayworkers' Association, and assure you I will do my best to follow the examples of my worthy predecessors. I know that if I follow their example, there will be no cause for complaint. Nominations for Vice-President are now in order.

Mr. F. Plumb: I feel as though this thing was slipping and sliding away from us—we are so near the Indiana line, and in order that we may retain our grip on the Association, I nominate for Vice-President a gentleman who lives in Illinois, Mr. O. W. Dunlap, of Bloomington.

Mr. Heafer: I would like to second that nomination. Mr. Dunlap, living in Bloomington, should have been elected President last year, but he was so modest and unselfish that he stood back and pushed me forward. Therefore, I am happy to be able to second his nomination.

Mr. Randall: I think when the facts are known, you will find that Mr. Dunlap is an ex-Indianian (Laughter) and I am very glad to second his nomination. It has been said that Indiana is a good State to come from. I think it is a good State to stay in. I move that the Secretary cast the unanimous ballot of this Association for Mr. Dunlap for Vice-President, and I would say on his behalf that he has been called away. Were he here I know we would hear a very eloquent and flowery speech, but we will get that next year.

The motion was seconded, Secretary Stoll cast the ballot and Mr. O. W. Dunlap was declared elected.

Mr. Purington: Before we elect a Treasurer, I think we ought to know if the man was born in Illinois and lives here. (Laughter.)

Mr. C. O. Swift: I would like to nominate for Treasurer a man I heard referred to this morning as the "Biggest and ugliest man who attends the convention." I am not saying it myself. (Laughter.) I refer to Wm. Hammerschmidt.

Mr. Mamer: I second the nomination and move that the Secretary cast the ballot for Mr. Hammerschmidt for Treasurer.

The motion was seconded and carried. Secretary Stoll cast the ballot and Mr. Hammerschmidt was declared Treasurer for the ensuing year.

President Butterworth: Nominations for Secretary are now in order.

Secretary Stoll: I desire to place in nomination for Secretary of this Association a resident of Illinois. I don't know where he came from, but he lives in Illinois, the proprietor and editor of the *Clay Record*, of Chicago, George H. Hartwell.

Mr. Hammerschmidt: I second the nomination of Mr. Hartwell, and if there are no other nominations, move the rule be suspended and Secretary Stoll be instructed to cast the unanimous ballot of the convention for Mr. Hartwell.

Duly seconded and carried, and Secretary Stoll cast the ballot.

Mr. Heafer: I would like to be sure we are on safe ground. I have been afraid to nominate anybody for fear Mr. Randall would tell us he was from Indiana. (Laughter.)

Prsident Butterworth: I will ask Mr. Hartwell to come up here and give us a history of his past life.

Mr. Hartwell: I am afraid that would not look well in print. I was born in Illinois, always lived in Illinois. (Laughter.) It is a pretty good State, and I hope always to live here. I thank you, gentlemen, for the honor you have conferred on me.

Dr. Converse: I was born in Ohio. I could have been born in Indiana if I had wanted to, but I did not want to. (Laughter.) Mr. President, there is a very pleasant duty devolving upon me. It is one of these very interesting occasions, pleasant in one respect and less pleasant in another. We have today one of the officers of this Association who is about to change his residence from Illinois to Ohio. There is nothing wrong about that any more than we hate to give him up in Illinois. He has grown old and infirm in the arduous duties as Secretary of this Association. He has been elected and re-elected for the past fifteen years. He has addressed you and myself and others a great many letters, some of which have been answered and some of which have been neglected. The Association appreciates greatly the services of Mr. Stoll, in the fifteen years he has labored with and for this Association, there has been no criticism at all passed upon anything he has done. On the contrary he has received the favorable commendation of every member of this Association. It has been noticed that he is getting a little bald-headed, and the cause for this was on account of his "butting in." It was thought advisable by the members of this Association to make him a present of a timepiece, so he would know just when to "butt in" (Laughter) and the result is we have bought him a watch and charm. This watch is what is called an Ingersoll watch. It is named "Ingersoll" because it is a heretic—you can *hear it tick* clear across the room. (Laughter.) There is something about this watch that will revive old memories. There is a pack of cards to indicate the time of day, instead of the figures. While it will not be proper for me to make any reference to the cost of the watch, but this charm cost us $76.50. It is a fish and indicates that we hope he will get along swimmingly, and it has got attached to it not the State of Indiana, but the State of Illinois. (Laughter.) The State of Illinois is indicated on the reverse side, which indicates that when he comes into Illinois from Ohio, we expect him to back in. (More laughter.) Every member of this Association is under obligation to help Mr. Stoll keep this watch in repair. When he comes to our respective plants if that watch is out of repair, each member of this Association is under personal obligation to repair it for him, and if any of you are getting so economical as to be unwilling to furnish the oil for the watch, it will be paid for out of the funds of the Association. (Laughter.) I believe I have made a mistake in the watch—this is an Indiana watch (Laughter and applause.) Mr. Stoll I am glad I did not give you that Ingersoll watch. This is the watch we have bought for you. It is marked upon it "G. C. Stoll from the I. C. W. A.," meaning Illinois Clayworkers' Association—I thought at first it was Young Womens' Christian Association. Our members wish me to present this to you as a slight token of their appreciation of your services. (Applause.)

Mr. Stoll: I was born in Ohio, too. I can't thank you. If Dr. Converse had made this presentation speech like a man once made to his schoolmate, I could have responded like the schoolmate did. Two boys grew up together in the same town. One went to college and studied for a lawyer, the other went into the navy. In course of time, the one who went into the navy came home and the citizens of his town wanted to present him with some token. They bought him a sword, and his schoolmate was to make the presentation speech. They had assembled in the friend's room, and the lawyer got up and he looked at Joe, and his eyes filled with tears, and finally he pulled out the sword and said, "There it is, Joe." And Joe said, "Is it, John," and sat down. Now, I could have made a speech like that, but I cannot make any remarks appropriate to the occasion at all. I am like the fellow who went hunting. He saw a deer, and by the time he got his gun raised the deer was gone, and he said, "The D-d-d-arn thing is gone." Everything I want to say has gone from me. I appreciate this very highly, and I want to thank you all for this very fine gift.

G. H. Hartwell, Secretary-Elect, Chicago, Ill.

Mr. Heafer: This ought to be a warning to future secretaries. Mr. Stoll here has worked along for fifteen years and never got anything, and when he refuses to stand for re-election, they make him a present. (Laughter.)

President Butterworth: Gentlemen, we have finished our program. I want to repeat what I said this morning that the brickmakers of Danville extend an invitation to all of you to visit our plants this afternoon at any time that suits you best. I am voicing the sentiments of every brickmaker in Danville when I say that the latchstring will be out the entire afternoon, and so far as that is concerned, at any other time you may desire to visit our plants. A motion to adjourn is in order.

On motion the convention then adjourned.

LIST OF MEMBERS OF ILLINOIS ASSOCIATION.

Abingdon Brick & Tile Co.	Abingdon, Ill
A. Randall	Bartonville, Ill.
L. H. Lambert	Beaverville, Ill.
E. M. Heafer	Bloomington, Ill.
O. W. Dunlap	Bloomington, Ill.
Brook Brick & Terra Cotta Co.	Brook, Ind.
G. C. Stoll, (American Clayworking Machinery Company)	Bucyrus, O.
F. Titterington	Carbon Cliff, Ill.
W. B. Corliss	Cayuga, Ind.
J. W. Stipes	Champaign, Ill.
G. J. Walters	Chatsworth, Ill.
Davis Brown, (Chambers Bros.)	Chicago, Ill.
H. de Joannis	Chicago, Ill.
L. E. Rodgers, (New York Blower Company)	Chicago, Ill.
J. J. Gledhill, (American Clayworking Machinery Co.)	Chicago, Ill.
A. S. Wehrheim	Chicago, Ill.
George H. Hartwell	Chicago, Ill.
Chicago Brick Machinery Company	Chicago, Ill.
M. V. Robb	Clinton, Ind.
J. W. Robb	Clinton, Ind.
J. M. Mamer	Campus, Ill.
Mamer Bros.	Campus, Ill.
H. H. Prather	Covington, Ind.
F. W. Butterworth	Danville, Ill.
A. L. Tidmarsh	Danville, Ill.
J. G. Shea	Danville, Ill.
John C. Shea	Danville, Ill.
Fred S. Selley	Danville, Ill.
Western Brick Company	Danville, Ill.
J. A. Welch	Danville, Ill.
G. W. Roberts	Danville, Ill.
S. S. Curry	Danville, Ill.
D. C. Haeger	Dundee, Ill.
George M. Krick	Decatur, Ind.
L. H. Martin	Dwight, Ill.
W. M. Pratt	Earlville, Ill.
D. H. Arbogast	Farmer City, Ill.
Wallace Manufacturing Company	Frankfort, Ind.
W. S. Purington	Galesburg, Ill.
J. W. Rust	Hartford City, Ind.
C. and A. Potts & Co.	Indianapolis, Ind.
A. E. Davis	Indianapolis, Ind.
T. A. Randall & Co.	Indianapolis, Ind.
A. W. Thatcher	Ivesdale, Ill.
Bates Machinery Co.	Joliet, Ill.
M. C. Meigs	Lafayette, Ind.
William Hammerschmidt	Lombard, Ill.
Mechanicsburg Brick and Tile Company	Mechanicsburg, Ill.
D. M. Cook	Mackinaw, Ill.
F. D. Judy	Mackinaw, Ill.
P H. Tiernan	Macomb, Ill.
F. A. Martin	Mason, Ill.
C. L. Smith	Mason City, Ia.
James Van Inwagen, jr.	Momence, Ill.
A. Connor	Montezuma, Ind.
John Grettencort	Montezuma, Ind.
Oscar Frazee	Moweaqua, Ill.
J. B. Clemens	Newport, Ind.
Municipal Journal	New York city, N. Y.
J. M. Powell	Orestes, Ind.
A. H. Kanne	Peoria, Ill.
F. J. Kanne	Peoria, Ill.
F. R. Carter	Peoria, Ill.
D. H. Jansen	Pekin, Ill.
Charles Zoeller	Pekin, Ill.
J. D. Jansen	Pekin, Ill.
D. F. Johnson	Pinkstaff, Ill.
A. S. Curry	Reddick, Ill.
Frank Fellers	Ridgefarm, Ill.
George H. Williams	Roanoke, Ill.
Sangamon Brick Co.	Springfield, Ill.
A. L. Converse	Springfield, Ill.
J. P. Fargo	Streator, Ill.
C. C. Barr	Streator, Ill.
F. Plumb	Streator, Ill.
S. C. Cowgill	Summitville, Ind.
H. Brewer & Co.	Tecumseh, Mich.
L. R. Whitney	Terre Haute, Ind.
M. W. Blair	Terre Haute, Ind.
F. D. Oakley	Terre Haute, Ind.
James Luther	Terre Haute, Ind.
S. M. Cowgill	Terre Haute, Ind.
Oliver Tillbury	Towanda, Ill.
F. E. Swift	Washington, Ia.
C. C. Martin	Watseka, Ill.
G. T. Spaulding	Waukegan, Ill.
C. O. Swift	Waverly, Ill.
Zion City Brick Yards	Zion City, Ill.

CLAY TESTING.

An Important Feature of The American Clay Working Company's Great Plant.

EVEN TO THE uninitiated a visit to the clay testing department of The American Clay-Working Machinery Company at Bucyrus, Ohio, is most interesting. People from all parts of the world who have looked over these large and interesting factories, who have noted the up-to-date shop methods, appliances and system, have paused with rekindled interest to observe the working of the clay testing department and have spent hours watching its operation.

Here are found the primitive methods of the hand mold process side by side with the most approved and modern methods, found only in the "built right, run right" line of clayworking machinery. On every hand are evidences that a complete brick yard is here in full operation. In addition to the methods of a modern yard there are the appliances which make a fully equipped clay laboratory. No clay problem comes to this department without a full solution being made. No shale or clay arrives but what it is given an accurate, exhaustive test and the verdict rendered, which, though not always pleasing to the prospective customer, is in acordance with the merits of the clay and is not biased by any desire to sell machinery. Once your clay has been tested in this department you have an accurate knowledge of what can be done with it and that, too, without the expense of equipping a plant only to record a possible failure. This broad-minded policy which is practised by this company has made it possible for capital to become interested in clayworking plants without hesitating as to the possibilities of the clay. This has made a tendency toward developing the clay industry of the country and extending the scope and usefulness of the clayworker. It has developed the brick business from the homely little soft mud mill, which years ago was found in operation at a convenient crossroad, to an industry which is second in magnitude to only coal and iron. The soft mud mill operated with a horse and sweep has faded away and in its stead plants have grown as though by magic to win the plaudits of an astonished and admiring public. To many people a brick, no matter of what quality, brings to mind the old hand yard of a generation ago and not a few people retain the idea that all brick are still made by the old process and methods of their childhood.

The Grinding Pan.

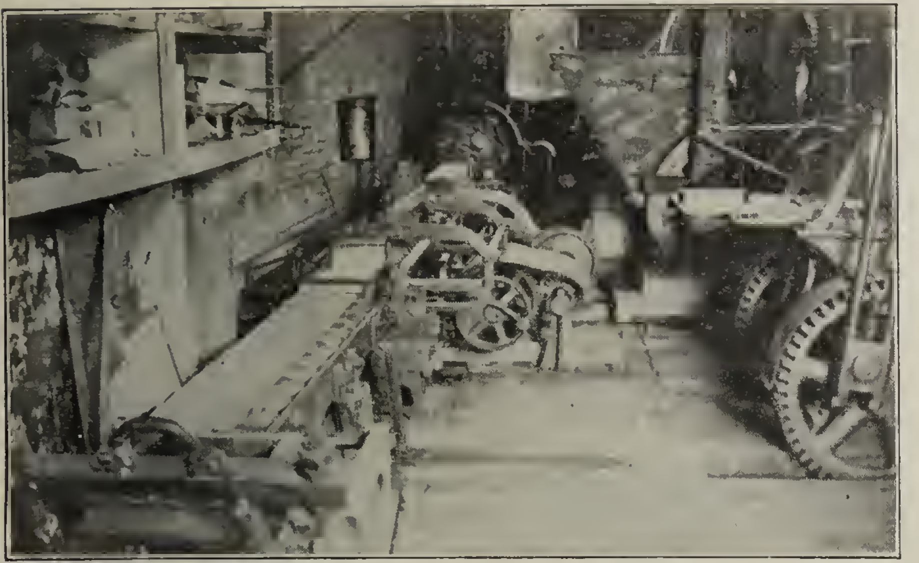
It is for these reasons that even to a disinterested person, a trip through the American Company's clay testing department is most interesting, while to a practical clayworker it is a treat, and he will spend hours at a time watching the testing of his own or some other clay. In this department is found a modern dry press converting a pile of dry dust into the most beautiful of bricks solid in texture, true and smooth on edges and as smooth on sides as a sheet of glass. Here is the Giant Auger Machine and the Rotating Automatic Cutter working in perfect harmony and unison, both seemingly intent on turning out the greatest possible number of perfect wire cut brick, the only doubtful factor being the clay and its qualities which enter largely into the possible speed. Not far off is the ever ready and always popular Eagle Repress ready to take the bricks and transform them from an ordinary wire cut into a perfect paver or a pretty repress front brick. Close by are soft-mud machines, hand power tables, and the massive grinding pans and smaller reduction mills. The hollow block and conduit machinery are centers of attraction, while the plunger machine and screw presses are interesting adjuncts. The hand power presses, the small laboratory presses, the filter press and other machines for handling all kinds of clay by all processes; all are found ready for use as required.

At a convenient point is a Tunnel Dryer in full operation, drying clay products in the shortest possible time, dependent upon the qualities of the clay. Next to it are the burning kilns in which the product is burned.

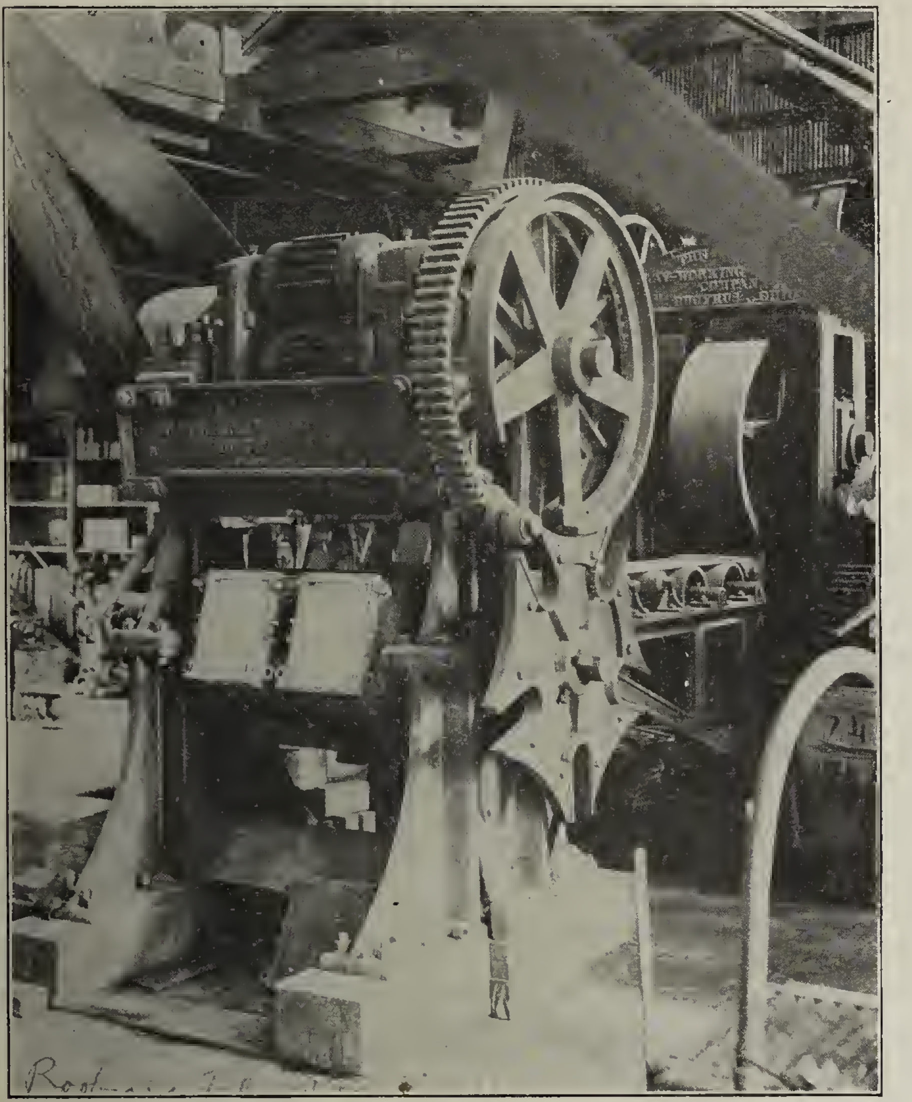
The whole outfit is a complete and model plant. Every test is made with the utmost care and is put through separately to avoid any possible errors so that when the finished product is sent to a customer he is assured of just what his clay will do and what machinery is best adapted to the working of his particular clay.

The Dryer.

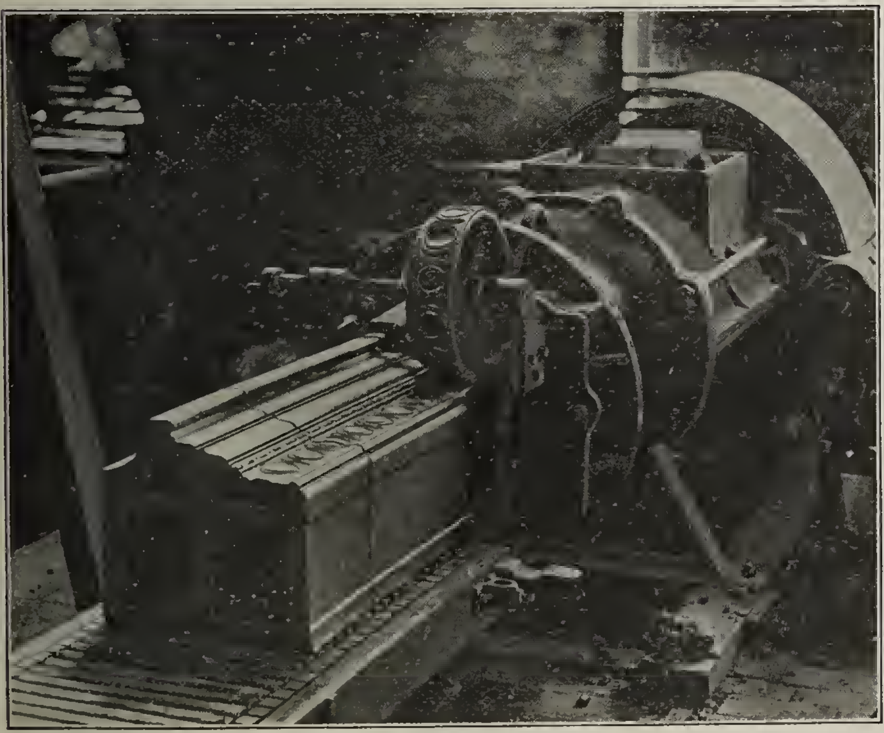
In a recent letter Chambers' Brothers Co., Philadelphia, Pa., advise us that they have engaged Mr. Lincoln S. Morrison, eldest son of the late R. B. Morrison, to represent them in the Southern States. They say, "Mr. Morison comes of well known brickmaking stock, and has had a practical brickyard training, under his father, that will help him in his new line of work. We bespeak, for him, a kindly reception on the part of our friends throughout the South, upon whom he will call as rapidly as possible."



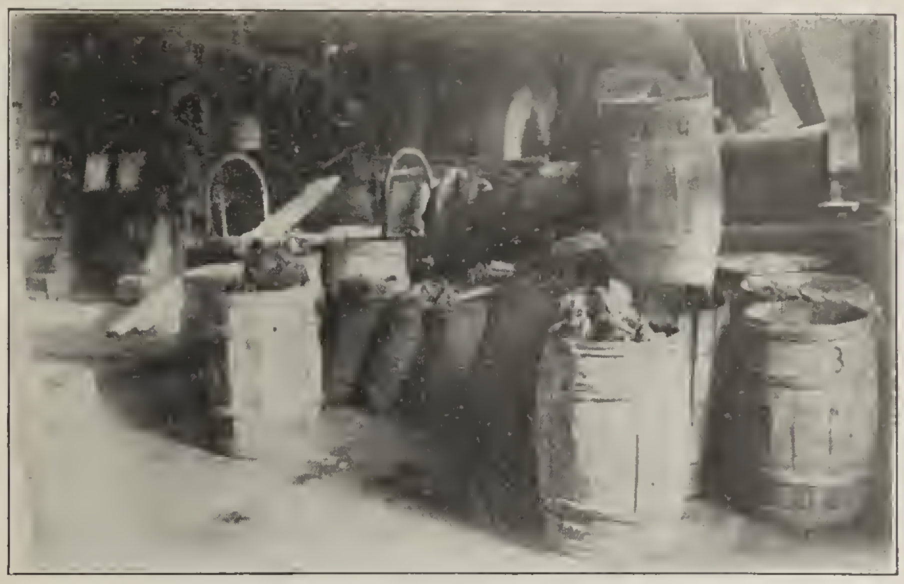
Auger Machine and Automatic Cutter.



Roofing Tile Press.



Hollow Block Machine.



Clay Sent in to be Tested.

The Burning Kilns.

The Dry Press.

OFFICIAL ANNOUNCEMENT.

The Eighteenth Annual Convention of the National Brick Manufacturers' Association and the Sixth Yearly Meeting of the American Ceramic Society will be Held at Cincinnati, O., February 1 to 13, 1904.

IN DEFERENCE to the expressed wish of a large number of our members for the selection of a central point for our next meeting, it has been decided to hold the Eighteenth Annual Convention of the National Brick Manufacturers' Association, and the Sixth Yearly Meeting of the American Ceramic Society at Cincinnati, O., February 1 to 13, inclusive.

The first N. B. M. A. Convention was held in Cincinnati, in September, 1886, when less than fifty of those who had signed the call, gathered for the purpose of organizing the Association. Since then the membership has grown steadily until it now numbers over five hundred. It is confidently anticipated that our return to the Association's birthplace will be celebrated by a larger attendance than at any previous convention. Certainly the accessibility and attractions of Cincinnati justify these expectations, for it is in the very heart of the territory from which the major part of our membership is drawn.

Hotel Headquarters.

Headquarters during the Convention will be at the Grand Hotel, Cincinnati's largest and best hostelry. Delegates and those acompanying them will be entertained at a minimum rate of $3.00 per day each person, and upwards, according to location, two or more persons in a room. The Grand is located directly across the street from the Union Station, so that those who arrive over the Baltimore & Ohio, Chesapeake & Ohio, Queen and Crescent, or Big Four lines need but step across to the Third street entrance and take the elevator. Those coming over the Pennsylvania Railroad and other lines can take street cars direct to the Fourth street entrance.

Convention Hall and Exhibition Room.

The deliberative sessions of both Associations will be held in the assembly room of the Grand Hotel. The Ceramic Society will meet Monday, Tuesday and Wednesday forenoon, the 1st, 2d and 3d. The N. B. M. A. meetings will begin Wednesday afternoon, February 3d, and continue through the week as heretofore.

The exhibits will be placed in the long Third street hall, which adjoins the convention hall, and is 18 feet wide and nearly 200 feet in length. The exhibits will be placed on each side of this hall and a clear passage of six feet in width will extend through the center. Thus each exhibitor will have wall space for the hanging of pictures or posters. This space will be free to members. Those desiring to display light machinery or models of same are requested to advise the Secretary as to amount of floor space required and character of exhibit. Exhibitors are advised to install displays Tuesday, and be ready for visitors Wednesday morning, there being no N. B. M. A. session till Wednesday, at 2:30 p. m.

Reduced Railroad Rates.

Reduced railroad rates on the Certificate plan have been granted by the Central Traffic Association, and all the other Passenger Associations have concurred, and a two-thirds rate will be made from all points in the United States east of Denver. To obtain this rate, delegates and those accompanying them must pay full fare for the going trip and take a proper certificate for same from the ticket agent. This certificate, when properly viseed, will entitle the purchaser to a return ticket at one-third the fare paid, making a two-thirds rate for the round trip. Those starting from small towns should make inquiry of local Ticket Agent a few days in advance to insure the receipt of proper certificate. If certificates are not taken, the reduced rates cannot be secured. As it takes some little time to make out the certificates, *delegates should present themselves at the ticket office at least thirty minutes before the departure of trains.* If through tickets cannot be procured at the starting point, tickets should be purchased to the nearest point where such through ticket can be obtained, and there purchased through to Cleveland, and a certificate from the ticket agent at the place where each purchase is made should be requested. The latter feature is imperative. No refund of fare can be expected because of failure of delegates to obtain certificates. Should any ticket agent be unable to furnish a certificate on the regular printed form, delegates should take a written receipt, setting forth the fact that certificate was asked for and could not be furnished, and stating the amount of fare paid, the name of the station where purchased and the names of the railroads over which purchaser is ticketed. Such receipt, bearing the agent's official stamp, will enable delegates to obtain the proper refund. Return tickets will be good until midnight of Wednesday the 17th.

N. B. M. A. PROGRAM.

First Session—Wednesday 2:30 p. m., February 3, 1904.

Prayer by ——————

Enrollment of New Members and Roll Call.

Welcome to Cincinnati by His Honor, Mayor Fleischman.

President's Annual Address, R. G. Eisenhart, Horseheads, N. Y.

Report of Treasurer, John W. Sibley, Birmingham, Ala.

Election and Installation of Officers.

"Our Record of Progress—Eighteen Conventions by One Who has Attended Them All," D. V. PURINGTON, Chicago, Ill.

General Discussion led by ——————

"What Machinery Men Have Done For Brickmakers."
J. H. CHAMBERS, Philadelphia, Pa.

"What Brickmakers Have Done for the Machine Manufacturers."
DR. A. L. CONVERSE, Springfield, Ill.

General Discussion led by ——————

Annual Banquet.

An Associational Dinner will be served Wednesday at 7:30 P. M., in the main dining room of the Grand Hotel. All delegates and guests including the ladies will participate in this function, which will be given under the auspices of the Brickmakers of Cincinnati.

There will be other entertainments arranged for the visitors, including a theater party for the ladies, of which further announcement will be made in the official programme.

NOTE.

All formal resolutions should be presented in writing.

At the close of each essay or address the subject under consideration will be fully discussed.

No papers or essays not included in the regular programme will be heard unless previously submitted to and approved by the Executive Committee.

Addresses for Thursday's and Friday's Sessions.

"Mechanical vs. Hand Method of Handling Clay."
A. F. SMITH, New Brighton, Pa.

"The Use of Brick," Illustrated with stereopticon views.
WM. B. ITTNER, St. Louis, Mo.

"Report of Committee on Exhibition of Clay Products at the St. Louis Exposition," Illustrated.
PROF. H. A. WHEELER, St. Louis, Mo.

"Sand-Lime Brick from a Brickmaker's Point of View."
DANIEL P. DeLONG, Glens Falls, N. Y.

"The Report of the Committee on Technical Investigation," Illustrated.
PROF. EDWARD ORTON, Columbus, O.

"Neglected Details in Brick Pavement Construction," Illustrated.
PROF. I. O. BAKER, Champaign, Ill.

"Brick Pavements, or the Permanent Improvement of City Streets."
W. E. GUNN, C. E., Covington, Ky.

"The Manufacture of Brick from Southern Shales."
H. J. MATTHEWS, Birmingham, Ala.
"Out of the Beaten Path." C. F. BINNS, Alfred, N. Y.
"The Face Brick Proposition." D. C. MEEHAN, Columbus, O.
"The Financial End of the Brick Business."
PHIL. J. HODGMAN, Wheeling, W. Va.
"Manufacture of Salt Glaze Brick."
ISAAC HARDY, Worksop, England.
Reports of Committees, etc.

Questions for General Discussion.

What is the best construction for an exhaust-steam, hot-floor dryer?

Is not a soft mud machine-made fire brick as good in every way as the hand-molded brick?

Is it practicable to establish standard tests for building brick? If so, what action should be taken by our Association in the matter?

Under favorable conditions in the United States, what should be the cost in actual practice of the sand-lime brick?

What tests should be made to determine the fitness of sand-lime brick for building purposes?

Should the specifications and requirements for sand-lime brick differ from those for ordinary brick and in what particular?

Is the demand for Harvard brick destined to last?

Would the profit-sharing system applied to brick manufactories be beneficial or otherwise?

Can the manufacture of paving brick be made profitable in a granite country? Or, in other words, is the best quality of brick paving more economical than granite in a granite country?

Will not any clay burned in old fashioned clamps with wood fuel produce Harvard brick?

Should flint clay, when used in the making of high grade fire brick, be calcined or burned before being mixed with the plastic bond clay for making into refractory brick? If so, why?

How can the Kansas brickmakers most successfully dispose of the lime deposits on top of their shale bank?

Is it practical to slip green brick and salt glaze them for light colors?

Is it necessary for a brickyard superintendent to be a practical brickmaker?

Is it a paying proposition to use exhaust steam in drying brick made from clay that will stand a high initial heat, particularly when a maximum output is desired?

Is the waste heat system capable of close enough relation to successfully dry brick made from a tender clay—a clay, for instance, that will check if subjected to much more than normal summer heat to start with?

For how small a plant is it practical to use the waste heat system of drying?

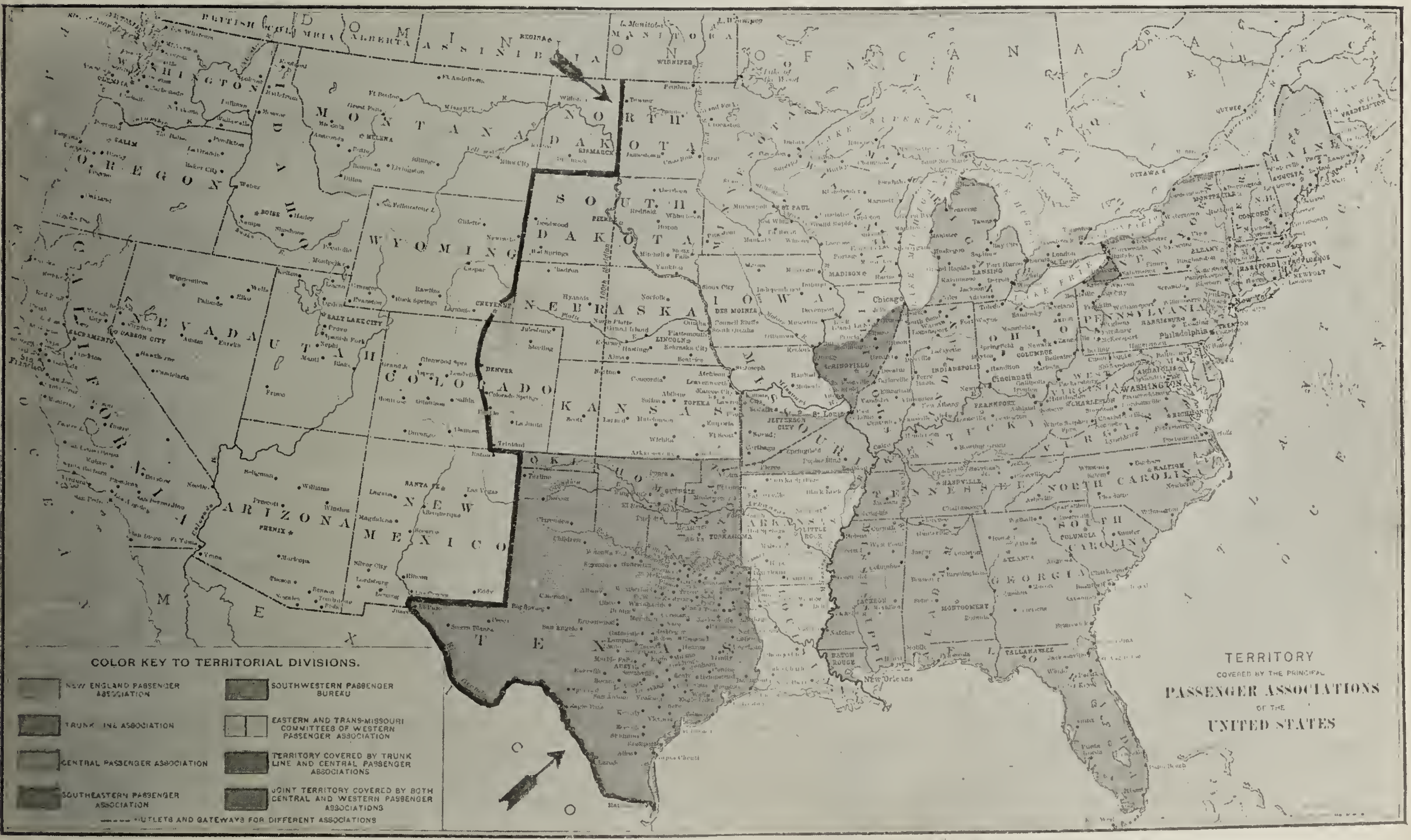
Can the output of a dry pan be increased by grinding or crushing the tailings in a separate machine? If so, what machine is best adapted to such purpose? Is the scheme economical and practical for a paving brick plant.

Side Trips to Clay Plants.

The second week of the Convention will be devoted to side trips to the brick, tile and pottery manufactories, of which there are many easily accessible to Cincinnati. This will afford those who desire to do so an opportunity of visiting the great press brick, paving brick and pottery plants of the Ohio valley. The great Rookwood Pottery will of course be visited by delegates and those who accompany them. The trolley car, Eden Park line, can be taken at the Fourth street entrance to the hotel, which passes within a few feet of the main entrance of the pottery.

Souvenir Badge. Membership and Attendance.

A handsome and very appropriate badge of membership will be presented to members and those accompanying them, with the compliments of Cincinnati brickmakers. It is the ambition


TERRITORY
COVERED BY THE PRINCIPAL
PASSENGER ASSOCIATIONS
OF THE
UNITED STATES
COLOR KEY TO TERRITORIAL DIVISIONS.
NEW ENGLAND PASSENGER ASSOCIATION
SOUTHWESTERN PASSENGER BUREAU
TRUNK LINE ASSOCIATION
EASTERN AND TRANS-MISSOURI COMMITTEES OF WESTERN PASSENGER ASSOCIATION
CENTRAL PASSENGER ASSOCIATION
TERRITORY COVERED BY TRUNK LINE AND CENTRAL PASSENGER ASSOCIATIONS
SOUTHEASTERN PASSENGER ASSOCIATION
JOINT TERRITORY COVERED BY BOTH CENTRAL AND WESTERN PASSENGER ASSOCIATIONS
OUTLETS AND GATEWAYS FOR DIFFERENT ASSOCIATIONS
DOMINION OF CANADA
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
NEBRASKA
IOWA
OREGON
IDAHO
NEVADA
UTAH
COLORADO
KANSAS
CALIFORNIA
ARIZONA
NEW MEXICO
TEXAS
ARKANSAS
TENNESSEE
KENTUCKY
OHIO
PENNSYLVANIA
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
MAINE
MEXICO

A fare and a [illegible]

Reduced Railroad Rates have been granted from all points in the United States East of the line drawn on the map above. Brickmakers of Texas, Oklahoma, Colorado and the Dakotas, as well as all of the Eastern, Central and Southern States, may participate, and are cordially invited to be present. The [illegible]

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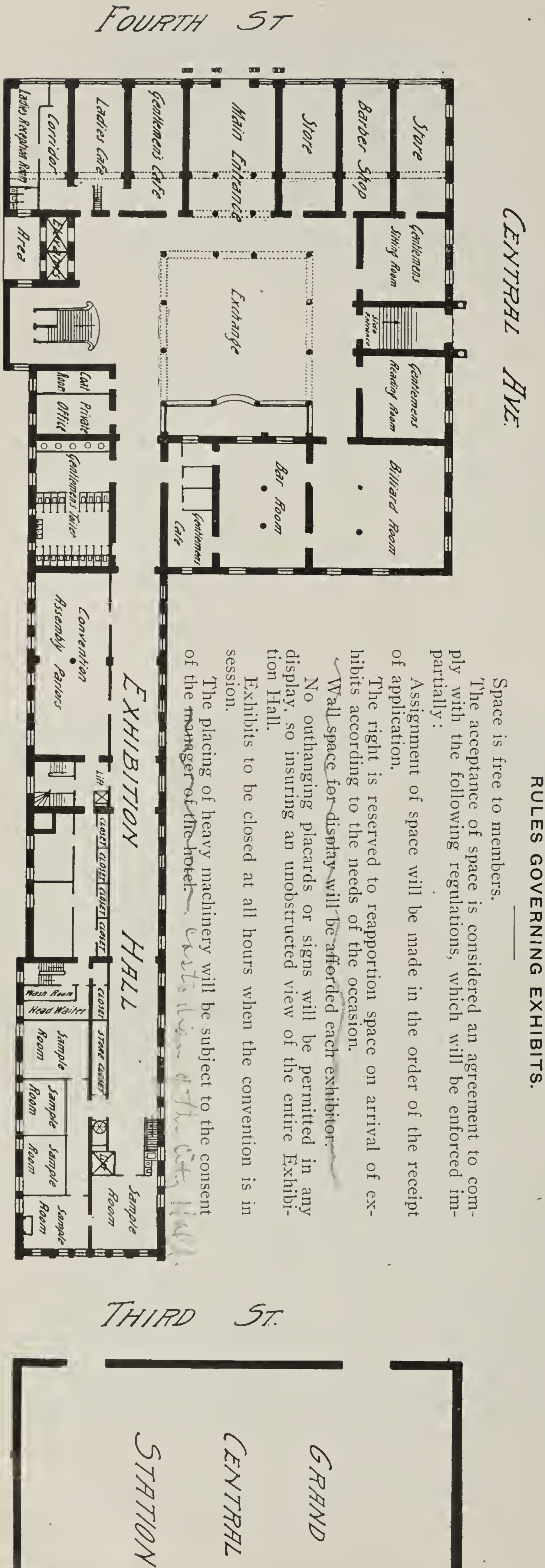


RULES GOVERNING EXHIBITS.

Space is free to members.

The acceptance of space is considered an agreement to comply with the following regulations, which will be enforced impartially:

Assignment of space will be made in the order of the receipt of application.

The right is reserved to reapportion space on arrival of exhibits according to the needs of the occasion.

~~Wall space for display will be afforded each exhibitor.~~

No outhanging placards or signs will be permitted in any display, so insuring an unobstructed view of the entire Exhibition Hall.

Exhibits to be closed at all hours when the convention is in session.

The placing of heavy machinery will be subject to the consent of the ~~manager of the hotel~~. Custodian of the City Hall.

and hope of the local committee to make every visitor happy.

All sessions of the Convention are open to the public. Those who are interested directly or indirectly in claywork of any character are invited to join the Association and attend the Convention. Members and their families or friends who may accompany them will be entitled to reduced railroad and hotel rates, and to participate in all side trips, etc. Those desiring further information as to requisite of membership, etc., are requested to communicate with the Secretary at Indianapolis.

THE EXECUTIVE COMMITTEE.
R. G. EISENHART, *President.*
THEO. A. RANDALL, *Secretary.*

THE LABOR QUESTION.

Civic Federation Movement in Cleveland, and Its Relation to the Building Industry.

BY WILLIAM H. HUNT.

SIR ALFRED MOSELY, the eminent English philanthropist, upon the occasion of his visit to Cleveland with the English Industrial Commission about a year ago, marked the beginning practically of the Civic Fderation movement in our city. This distinguished Englishman had brought to our country some twenty of the best known leaders of labor organizations in England for the purpose of studying industrial conditions.

WM. H. HUNT.

The delegates were received in New York by representatives of the National Civic Federation, were directed in their travels and assisted in their investigations, very largely by members of the national body. Cleveland, without regard to distinction as between employer and employe, extended hearty welcome to this commission. Large employers of labor, bankers, manufacturers, builders, merchants, together with representative wage earners of labor organizations, united to do honor to our English cousins, whose visit was with the object of gathering information that might help to improve industrial conditions abroad. A common interest, industrial betterment and American hospitality offered the opportunity for Cleveland capital and Cleveland labor to meet on common ground.

What the Civic Federation hopes to do is to maintain this common ground established, upon which economic principles may work out to proper solution some of the great problems that now confront the industrial world.

The wide interest in the work of the National Civic Federation was manifested recently at the conference held in Chicago, at which it was my pleasure to be present. Employers and labor representatives of world-wide reputation met to discuss ways and means to establish more rightful relations between workers and employers. Senator Hanna, the national chairman, who is devoting his best thought and efforts to the furtherance of this movement,—one of the greatest humanity has ever made,—railroad presidents and manufacturers met with Samuel Gompers, John Mitchell, Dan Keefe and other notable leaders of the labor movment. Several hundred men were in attendance at the conferences and the banquet, a co-mingling of the two great divisions —capital and labor—such as never before occurred in this or any other country.

What the Civic Federation seeks to do, as set forth in its statement of purpose, is, briefly, to be helpful in establishing rightful relations between employers and workers, to endeavor to obviate and prevent strikes and lockouts, to aid in renewing industrial relations where a rupture has occurred. It believes that employers and workers should confer for the adjustment of differences or disputes before an acute stage is reached. Mutual agreements as to conditions under which labor shall be performed are encouraged and when agreements are made, the terms thereof should be faithfully adhered to, both in letter and spirit, by both parties. When requested, it acts as a form to adjust and decide upon questions at issue; it assumes no powers of arbitration unless such powers be conferred by both parties to a dispute.

The National Civic Federation was organized some three years ago. Object lessons could be recited for hours, of misunderstandings and contests between employer and employe, that have been amicably settled during this period, by the good offices of the Federation.

The national movement is directed by ninety-nine members, representing three equal divisions: wage earners, employers and the public. The executive work is largely vested in a smaller committee, known as the Board of Conciliation.

Branches are now being established in all the principal cities, some modifications of the New York plan of organization being necessary to meet local conditions. Cleveland, Chicago and St. Louis have already been organized.

The Civic Federation is a movement born of necessity. Industrial and social evolution, the development of our country, the tendency of the times toward consolidation and concentration of power, both of capital and labor, have added difficulties which must be met. Our prosperity has brought about a general state of agitation, with capital to make more capital, with labor to make a more equal division of the fruits and favors of prosperity. The industrial march cannot be one-sided. If capital prospers, labor must, in like proportion; on the other hand, when any condition threatens the security of capital in its employment, just so surely must the consequences of that shaken confidence be shared by the wage-earner as well. Therefore, are not employer and employe alike interested in the consideration of grave dangers which threaten the future prosperity of our country and the peace of our people?

Industrial promotion and political methods in business have brought into our commercial life elements of danger and evil which must be checked. The peril is not in logical industrial development, but in injudicious industrial promotion, which gives to the unscrupulous leaders of commerce and finance opportunity to impose upon the credulity of the general public. There is a marked point of distinction between business sagacity and business generalship on the one hand and sharp practice, or perhaps studied treachery on the other. We have recently had conspicuous examples of so-called "Captains of Industry," having been, in fact, captains of criminal practices; the genius of finance is actually genius of perfidy. When men occupying the highest places in industry, commerce and public affairs, use their positions of trust for personal gain; when men seek public preferment by any means, good or bad, which may insure success, the public conscience protests against this outrage. With equal force does public conscience rebel against the tyranny and utter selfishness of the labor agitator whose reckless policy and inflammatory utterances tend to rouse labor to a feeling of hatred and prejudice against capital, and consequently endanger the public welfare. Men chosen to high office often have almost limitless power affecting the policies of their institutions. They sway the multitude, a power in the creation of sentiment, supporting wise and conservative administration; and an equal force in arousing prejudice and hatred because of alleged wrongs and inequalities.

Your thoughts are directed to the unscrupulous leader whose creed is selfishness and self-aggrandizement, who is so often followed without reasoning, and consequently at fatal cost. Whether upon the side of capital or of labor, we have a common enemy which must be met with a solid front until this menace to our industries and our prosperity shall have been exterminated.

While I have drifted somewhat, yet what has been said is pertinent to the subject. The Civic Federation places its reliance upon the individual sense of honor and reason that characterizes the average American citizen, upon that portion of our people who believe in the Golden Rule. Differences which arise as between capital and wage-earners are often more imaginary than real. If we can meet in a spirit of compromise, an adjustment can usually be arrived at. The Civic Federation movement has provided the forum, as it were, that there may be a place for the discussion and settlement of disputes along economic lines. The chief value of the Federation is in its conciliatory policy, the bringing together of the employer and employe, that there may be open and frank discussion of matters affecting their mutual interests.

The building industry has especial interest in this work of the Civic Federation. It may be urged upon you, however, that what the Civic Fderation aims to accomplish along the line of industrial peace must of necessity be largely a harvest of the future. There are conditions of the hour in the building trades which demand action. How can the interests of the builder be best subserved in dealing with the questions that are immediate? Organize! The great telling force in our national progress has been the co-operation of many minds, the coalition of varied elements and consequent concentration of authority and power, and the enlargement of capacity, all contributing to larger trade and civic possibilities. The slogan of every builder and dealer of the state should be "Organize!"—each trade for itself, and finally all affiliated with a central body, that all may be working on the same basis and in harmony.

The numerical growth of the labor movement, the strength and power exhibited by organized labor, should serve to inspire all branches of the building trades to compact organization. The building trades should be a unit in support of a fixed yet wise policy for dealing with all qustions pertaining to labor. What such an organization can do toward the correction of existing evils is incalculable.

Organize! Witness the assaults upon the building trades during the past year; the general demoralization of the industry at every important trade center. Our conspicuous infirmity in the matter of organizations is alone responsible for many of our troubles. Our weakness has invited the aggression of the strong. There has been great loss to our industry, beyond recovery. Let us apply the remedy. Organize!

Selfishness, the menacing cloud which has heretofore defeated united action in the building trades, must give way to a spirit of altruism. Every builder must be led to see that there will be more profit to his individual credit if he works with his fellow tradesmen for the common good, than will be the case if he tries to divert things to his own personal advantage.

Organize! that you may with one accord dispute every attempt at encroachment upon your rightful territory. Resist all unfair demands. Take that step which will insure to the building trades enjoyment of the fruits of its labor, that step which will insure peace. Organize! The Civic Federation is in harmony with the spirit of organization. Authority and responsibility are established and centralized. The scope and province of an organization are declared; there is usually a known policy in the direction of its affairs. Work along the line of conciliation is minimized and made more effective and far-reaching by dealing with an organization.

No organization should have standing that does not fully accredit itself by the authority of the state and by the proper declaration of its offices, its principles and its aim and object.

Organize! that the building industry may be properly safeguarded and that we may do our share toward industrial peace.

A NEW PLANT AT SELMA, ALA.

Mr. A. G. Kahn and Joseph Rosenbaum of this city, are erecting a large brick works of 50,000 daily capacity here which they expect to have in operation in the early spring. The power plant and machinery equipment, consisting of 150 horse power engine and two boilers, special clay separator, compound geared pug mill 777, brick machine and automatic cutter, Victor re-presses and necessary handling equipment, cars, etc., have been purchased of the C. W. Raymond Co. of Dayton, Ohio, through their New York City office at 39 Cortland street, N. Y.

HOME OF THE ANDRUS PRESS.

A Successful Manufactory Devoted Exclusively to Brick Machinery.

IN THE EXTREME southeastern corner of the great State of Iowa, is the flourishing city of Keokuk, which is becoming quite an important manufacturing center. It is known to brickmakers as the home of the Andrus Press, an old standby in the dry press branch of the brick business. Six months ago a hustling enterprising young Southerner, Mr. Wm. F. Scott, and known to his personal friends as "Dixie" Scott, left St. Louis, where he had been located for a number of years, and settled in Keokuk. It was our pleasure recently to visit him in his new home. We found him busy and happy and on looking about the factory we saw many evidences of prosperity. In fact, an atmosphere of strenuosity pervades every department of the establishment. Evidently the northern air agrees with Mr. Scott and his able assistant, Mr. Peter B. Gibson, by whom he was accompanied when he shook the dust of St. Louis from his feet.

Scott's "Auntie."

Orders for Andrus Press have come to them in unexpected numbers. Mr. Scott expected to succeed with the Andrus, but he did not anticipate so large a measure of success at the beginning. A trip through the factory, camera in hand, was productive of a number of interesting pictures, some of which we reproduce for the benefit of Mr. Scott's many friends in distant States, a few only of whom may hope to enjoy a trip through the factory with him. The pictures themselves tell a story of activity, for every department of the factory from the foundry through a well equipped machine shop, and on to the wood working department on the upper floor, is running full handed. This for a "yearling" is a good record. Another evidence of the success of the firm is a brand new office building, built of brick, and cozy as cozy can be inside. They are not only making Andrus presses, but a line of clay pulverizers, cuts of which are shown on pages 18 and 19, a line of brick barrows and trucks, and other brickyard supplies, including an improved mold box which can be fitted to any dry press machine, as well as the one manufactured by the Scott Manufacturing Company.

In going about the factory, we noticed that every individual workman seemed to take a special interest in what was going on. Even the colored "Auntie" who wields the broom and duster seemed to think that the success of the firm depended in no small degree upon the care with which that work was performed. Perhaps Mr. Scott's success is really due to his ability to enlist the sympathy and enthusiasm of those associated with him in his work. At any rate he is succeeding in rapidly building up a gratifying trade, at which even his competitors, be it said, rejoice.

WHY THE ST. LOUIS FAIR WILL BE SUCCESSFUL.

'From all present appearances this year of our Lord 1904 is to be an exceptionally favorable time for exposition attendance. There is no war, no pestilence or famine raging anywhere to disturb commerce or endanger travel. The Exposition will open after a prolonged season of peace, a remarkably prolonged series of prosperous years for all industrial nations. At no former period have the great majority of men been in such easy circumstances, so well fed and housed and clothed, or with such leisure for travel and such luxurious, rapid and cheap transportation at command. In our own land good crops and good markets long continued have put the farmers in possession of ample bank balances. Manufacturing enterprises running overtime have enabled wage workers to accumulate larger saving deposits, and profitable activity has diffused prosperity throughout the ranks of all avocations. For every American able to attend the Columbian World's Fair in 1893 there must certainly be three now able to give their families a week at the Louisiana Purchase Exposition in 1904.—*Exchange.*

Written for THE CLAY-WORKER.

CLAY DUST No. 10.

Twenty Years' Growth—Thoughts Induced by Reading the December Clay-Worker—The Cost of Drying and Burning Brick—Convention Pointers—Value of Trade Journals.

BY A. LUMINA.

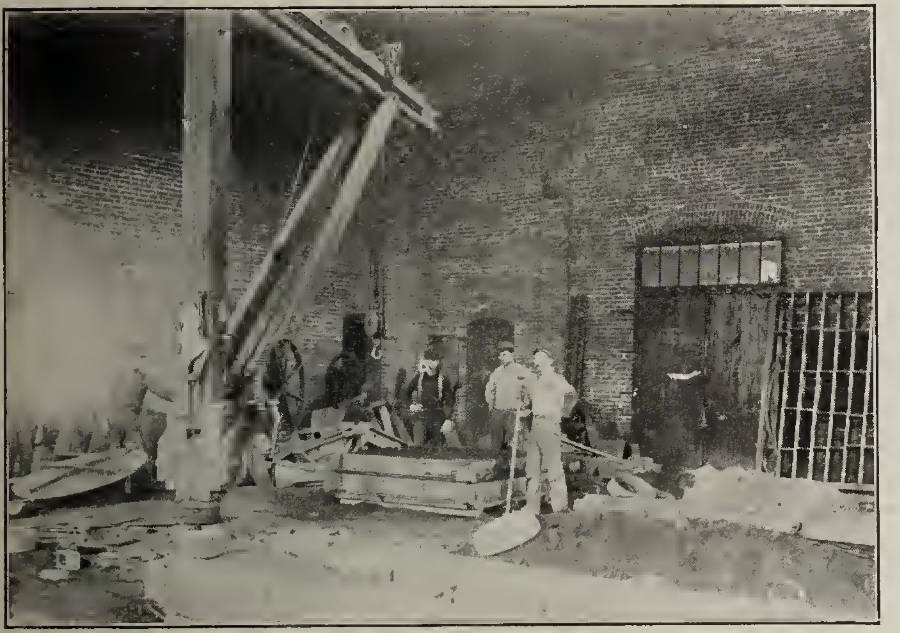
THE FIRST WEEK of the new year—a long distance from home—a cold wave—delayed trains, and nothing to read save the newspapers. Hold! In the bottom of my grip, packed a week previous, lies the December CLAY-WORKER. Seldom has "our journal" been more welcome or been more thoroughly read than was this number upon that belated train. No advertisements even escaped my notice. The fact that the number I was reading closed the 20th year of publication gave it additional interest and started reminiscences of my brickmaking experiences, beginning only about two years after the first appearance of THE CLAY-WORKER.

W. F. Scott, Keokuk, at his Desk.

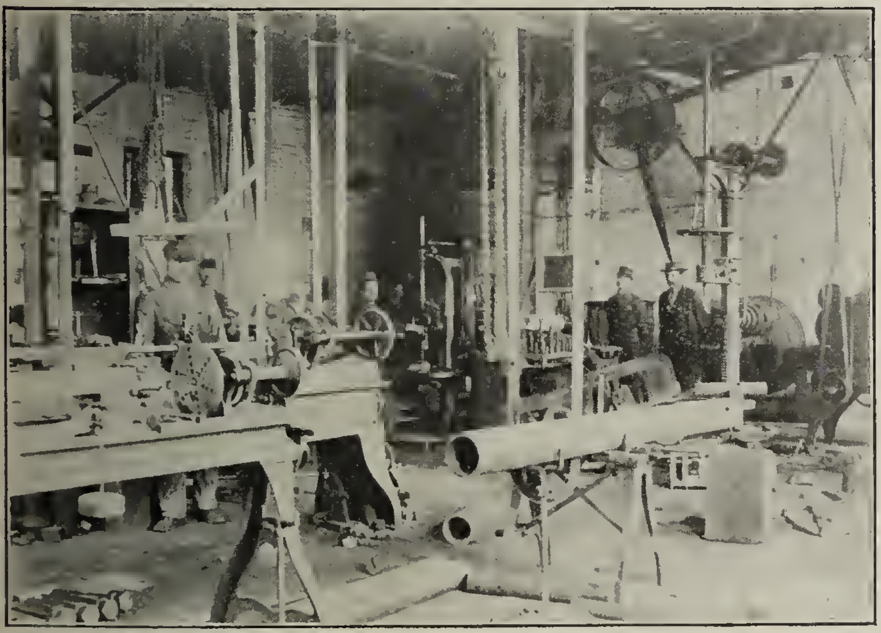
I never saw a brick made until 1886. In that year I began reading THE CLAY-WORKER and those early numbers had much to do in shaping my course and in deciding me to devote the rest of my life to the brick industry. I have all of the volumes of THE CLAY-WORKER since the 5th, beginning with July, 1886, and wish that I had the previous numbers to complete the set. If D. V. Purington should get more offers of these early numbers than he wants at $1 each I would like to make a bid for them. I would like to have now the first number to compare with the present one, but I will leave such comparisons to the publishers, who will be pardoned for indulging in considerable self-gratulation at the success of their undertaking and the growth of twenty years. The history of THE CLAY-WORKER is the history of modern brickmaking and it must be a source of pride to the publishers to have had such an influence in its development.

As I read the last number of the twentieth year so thoroughly

New Office and Factory of the Scott Manufacturing Company.



A Section of the Foundry.



A Corner of the Machine Shop.

I will make a few rambling comments upon those features that seemed to me most noteworthy and gave me most food for thought.

The advertisements are an interesting and accurate index of the progress of brickmaking and of the prosperity of the brick business. I made the mistake in getting my early volumes bound with the advertisements eliminated as far as possible, but hereafter I shall have the entire advertising pages of the January number bound in each year's volume. (Why do you make two volumes of each year?) What I object to in my bound volumes is the undue prominence given to certain advertisers who are permitted to sandwich their advertisements between the reading pages of the journal, and also that the advertising pages and the regular reading pages are not numbered separately. But you have heard this complaint from me before.

The noteworthy fact in the description of "A Great Railway Station," is that the brick facing was not furnished by a face brick company, but by a paving brick company. The wire-cut shale brick, not repressed, made by paving brick manufacturers to surround their paving blocks, in those parts of the kiln that do not produce good pavers, is becoming a formidable competitor of the more perfectly formed and expensive pressed face brick. That the use of these hard, durable, impervious, though somewhat rough and uneven-colored shale brick is going to increase and quite seriously affect the face brick manufacturer, must be evident to anyone who has observed the pleasing effect of the buildings erected with this facing. The brick seems to me more especially adapted to large business structures rather than to the private building or single residence. Such brick can only be procured from shale in closed kilns and the demand for them is a boon to the manufacturer of paving brick.

A statement in "Mr. Koch's Ruminations" should be carefully noted by those who are considering the building of a dryer or kiln—namely, the amount of fuel required for the drying and burning of brick. I intend to take this matter up specifically in a future paper, but I want now to bring out the fact that some advertisers of patent dryers and kilns are claiming to dry or burn brick with a consumption of less than the theoretical amount of fuel that is required to do the work under the most favorable conditions. Such advertisers may not know the impossibility of their claims, but their statements are none the less misleading. I wish I were sure that such advertising didn't pay, but it does seem to be a fact that the man who makes the biggest claims often gets the business. I have seen much evidence among brickmakers of the apparent truth of Barnum's famous saying that "The American people like to be humbugged."

The amount of fuel actually used in the drying or burning of brick under any conditions is always an interesting fact for publication. Mr. Ashby attempted to secure such fact for his article on the plant of the McNeill Pressed Brick Co., but in his interesting description he omitted to state the number of bricks that were burned with 10 cords of wood and 109 tons of coal.

The most noteworthy feature of this plant as described is the use of the exhaust fan during watersmoking. I have advised this for several years. The importance of a strong draft during the watersmoking for the prevention of scum, sticking of brick, and checking of bottom courses, as well as for the saving of time, is not generally appreciated. A large number of clays will scum in drying or watersmoking no matter what fuel is used, whether it contains sulphur or not, if the evaporation is slow and the moisture is not removed from the dryer or kiln as soon as it comes from the brick.

I want to commend Theo. Rizer for his instructive articles. They will pay for careful reading by the brickmaker and should be preserved for reference.

While reading the report of the "Potters' Convention I could not but question, heretical though it may seem to many, whether "we, the people," are not paying too dearly for their prosperity. With a higher protective tariff, which is a tax upon the people, enabling the potters to charge them higher prices, gives the American potter an enviable position in our markets. I am proud of the products of our potteries and I believe in fostering infant industries, but beyond that I think I should not be required to go. I am no doubt selfish. If I were a potter I would work for any legislation that would put money in my purse, but being simply a brickmaker, when I buy pottery I want the privilege of buying it where I can get the most value for the least cash. I could never be made to believe that patriotism required me to patronize home industries against my own pecuniary interests. As a brickmaker I have never used the home industry argument to induce my fellow townsmen to buy my brick in preference to brick made in another town, unless I could give them as good brick at as low a price. I take the liberty of expressing my views upon this question since the only part of the proceedings of the Potters' Convention published in THE CLAY-WORKER relates to their efforts to maintain the privilege we can give them, through our government at Washington, of charging us for their wares such prices as they may determine upon.

It is fitting that our late lamented William McKinley be eulogized by those who have grown rich through a protective tariff, but his late utterances give evidence that he was becoming a broader-minded statesman than they give him credit for, and that he began to doubt the wisdom of so high a protective wall for barring the operation of beneficent natural laws of commerce. Let it be hoped that England will not take a step backward and abandon the broad and liberal policy that has given her such a large share of the trade of the world.

How many charter members will be in attendance at our 18th Convention? I hope there will be a goodly number present. I would suggest that we honor them with a special badge at this meeting so that they won't have to repeat the assertion that they were the founders of our organization.

Who will be chosen as our next President? I haven't any tips on the matter, but if I understand the sentiment of the members it will be a man who has been a loyal worker in our association and a regular attendant at our conventions, and who is not seeking the place. Of course he must have some qualifications as a presiding officer and become a valuable member of our executive committee. Looking over the pocket list of members I name in order a few that in my opinion are especially deserving of and qualified for our chief officer: J. R. Copeland, Birmingham, Ala.; L. G. Kilbourne, Columbus, Ohio; H. C. Dunn, Erie, Pa.; W. S. Purington, Galesburg, Ill.; C. A. Bloomfield, Metuchen, N. J.; Clifford Chase, Milwaukee, Wis.; Frank L. Stiles, New Haven, Conn.; William Conway, Philadelphia; Xavier Wittmer, Pittsburg; Lemon Parker, St. Louis; Ellis Lovejoy, New Lexington, Ohio; George T. Dickover, Wilkesbarre, Pa.; Edwin Brockway, Brockway, N. Y.; W. G. Titcomb, Providence, R. I.; Elliot S. Morse, New Britain, Conn.; George Clippert, Detroit, Mich., and there are many other eligibles.

I was much disappointed in not being able to attend the Illinois Convention and see the famous brick plant of our friend Butterworth. I have read with interest the various accounts that have appeared in THE CLAY-WORKER of Mr. Butterworth's operations at Danville. His success verifies one opinion that I have been expressing for several years—that it is entirely practicable for even a common building brick plant, where most of the product is shipped by rail, and fuel is cheap, to use the round down-draft kiln for burning. The advantages over the up-draft kiln for getting better burns with more certainty and less skill, more hard brick and less waste, and of being able to use the heat from the cooling brick to the drying, more than offset the additional investment required.

"Foreign Scrapings" is a valuable part of THE CLAY-WORKER that I never overlook, though I am a regular reader of the *Tonindustrie-Zeitung*, probably the best technical brickmakers' journal in the world, from which many of the scrapings are made. In this number I want to call attention especially to the advantages of the perforated brick. I have long maintained that the cross-section perforations, preferably round holes, gives a harder, stronger brick, a dryer wall, and since they have less weight, are better for steel-frame structures and cost less for freight—an important item to the face brick manufacturer. I visited an enameled brick plant recently, where, instead of the usual panels that weaken the brick and take up mortar, the brick were made on an auger machine, not repressed, with the round holes an inch or more in diameter. These holes afforded an easy means of handling green brick without damaging the faces. I am not surprised to be told that that in a recent test for a government building the perforated brick stood a much greater crushing strain than the panelled brick.

In this number of THE CLAY-WORKER are notices of two suits in different places to recover damages alleged to have been done by the smoke and sulphurous gases from brick kilns. This fact it seems to me should be noted by those who are about to build brick plants, and provision made to insure themselves against such suits by building improved furnaces and high stacks.

The above points are those that chiefly attracted my attention in the December CLAY-WORKER. Others may take little note of these, but be more interested in features that seem to me trivial or commonplace. It is not to be expected that any article, however valuable it may be, will be of equal interest to all readers. There must be a constant repetition of primary facts and principles for the benefit of those who are just starting in brick manufacture, and there must also be technical articles for the more advanced students of the art. Personal experiences, if observed and recorded carefully, are always interesting and helpful.

The unsatisfactory thing about all our trade literature is that however valuable many of the contributions are they are practically inaccessible only to present subscribers, and even to them are often difficult to find when wanted for reference at a later date. The great need is more bound volumes of our clayworking journals and a good index of all articles that have any permanent value. To be sure THE CLAY-WORKER now furnishes a complete index at the close of the year, but this index is merely a list of the titles or headings under which they have apppeared and are often no indication of the matters treated upon in the article. Hence I have sometimes searched a long time for something that I ought to have been able to find in a minute.

Many do not realize the fact that the preservation of technical publications is almost sure to yield a profit, not only for one's own reference, but for sale to those who are sure to be collecting them some time in the future. For instance, what subscriber of THE CLAY-WORKER supposed the early numbers of this journal to be of any permanent value or worth keeping, but now witness Mr. D. V. Purington advertising to pay $1 each for these early numbers. D. V.'s purse is much bigger than mine, but I will also pay many times the subscription price for all numbers of THE CLAY-WORKER prior to July 1886. I also will give a liberal price for the report of the 5th Convention to supply the place of the one some one borrowed of me. I have lost my badge of the Louisville Convention and I would like to buy one to replace it.

The possession of all these things treating of or relating to the art of brickmaking is a source of power and pleasure and satisfaction to me now and I trust may be of interest and value to those who are to pursue the same line of work when I am gone and forgotten.

Small But Progressive.

Editor CLAY-WORKER:

I enclose herewith money order which apply to my subscription account.

There are no new ventures in the clayworking line that I know of in this part of the state for the coming year. I have had a very good year and no very bad luck. I only made one small kiln, (small compared to the output of the great yards of the east), but I had enough to supply the apparent demand until I can make more. I think I shall get a small wire-cut machine which I think will suit my trade the best. I can't see much more in sight for next year than for last year, but my trade is in such little pieces, that one can't estimate ahead. I am dependent upon farmers and they are a cheap class of builders. I have to teach them a lot. As it is, I have a hard time trying to convince them that it is cheaper to build good than poor.

F. L. DEXTER,

Wash., Jan. 2nd, 1904.

BRICKMAKING WAY DOWN SOUTH.

The Evolution of a Small Hand Yard to a Modern Plant Making 240,000 Brick per Day.

NINETEEN YEARS ago the writer started making brick by hand, and dried them on the yard. Now we have a capacity of 200,000 building brick and 40,000 pressed brick per day. Two of Chambers' largest stiff mud machines, with rotary cutters, make our ordinary brick, which we dry artificially in a steam dryer of our own get up. The clay we use is of a poor quality, making it difficult to mold by the stiff mud process, and extremely hard to dry. It requires three days to dry them thoroughly without checking them.

We dig our clay with a Marion steam shovel of one and one-half cubic yard capacity, then it is drawn in cars by a small locomotive to incline, from whence it is hoisted to the third floor, and then fed through a Chambers largest size disintegrater, and pugmill, into the brick machine. From machine the brick are carried through steam dryers of our own construction. Our brick are burned in up-draft kilns with furnace attached and wood is the fuel used. We have eight of these kilns containing each 800,000 to one million brick. A few years ago we attempted to use down draft kilns, but they were unsuccessful, and were discarded.

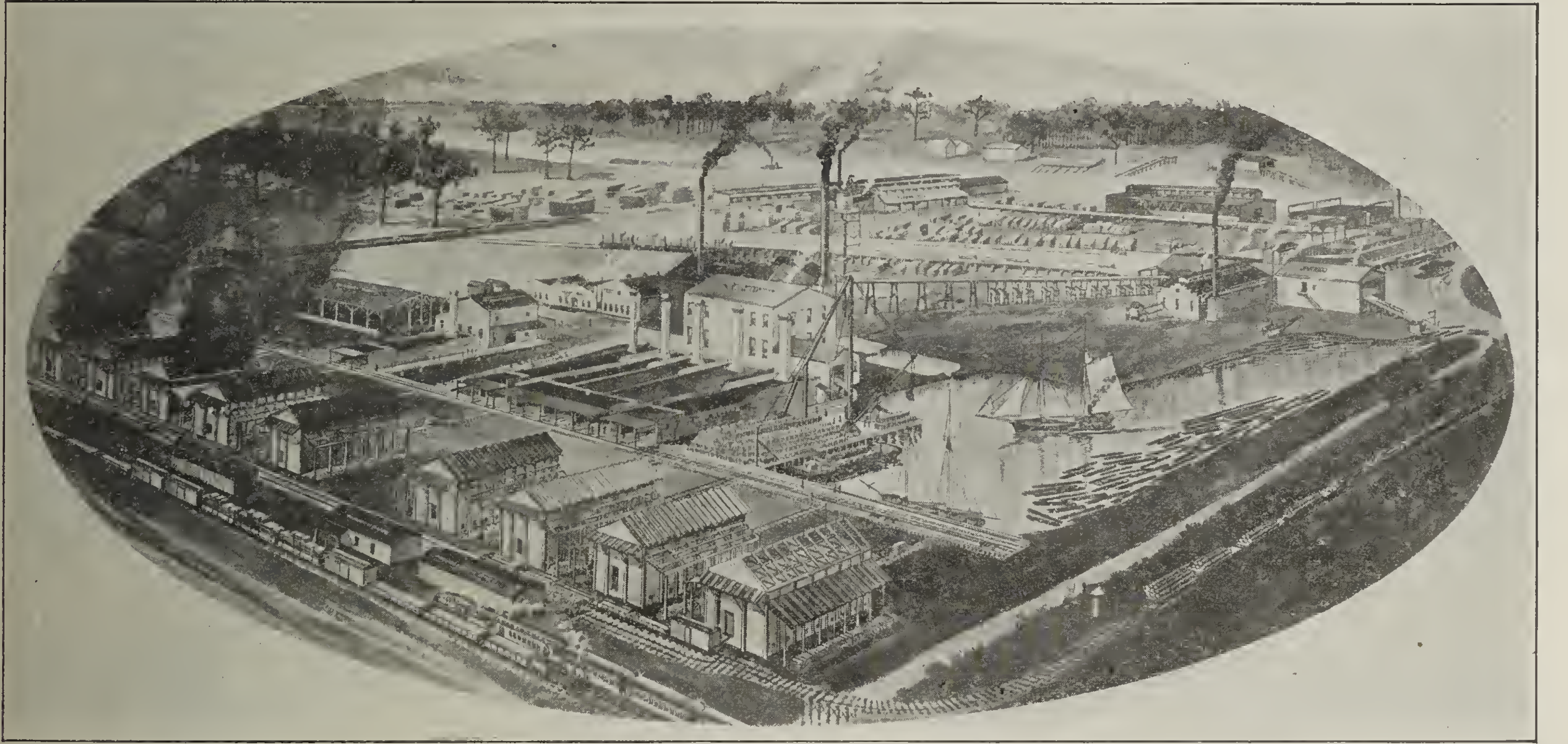
In another building we manufacture dry press brick, made on a Simpson and a Boyd four-mold press. Capacity of the dry press plant is 40 M and these are burned in the same kilns with the ordinary brick.

Our works being located between a small bayou, tributary to Lake Ponchatrain, and the N. O. & N. E. R. R. tracks, we ship most of our brick via water. The brick are loaded on pallets of 1,000 each in the kiln, from whence they are transferred to a derrick and then hoisted on barges. The barges are towed to New Orleans, where we operate another derrick to unload the barges, thus reducing cost of handling to a minimum. Our company own a fleet of barges and schooners, and steamboats used in transporting our output, both brick and lumber.

The last year has been an off-year in this market, New Orleans, brick being in poor demand, and leaving manufacturers no profit. The wages run fully 30 per cent. higher, and all supplies have advanced accordingly. The stagnant market is to be attributed partly to the unsettled condition of labor in the building trade lines in New Orleans, which is our chief market. Brick are being sold at the yard for $4.00 and $4.50 per M. Our company operates saw mills and planing mills, manufacturing both cypress and yellow pine. All the refuse from the mills is utilized in the brickyards as fuel.

F. SALMEN.

Slidell, La., Jan. 2.



Brick Plant and Lumber Yard of the Slidell (La.) Brick and Lumber Co.

COLLAPSE OF A CONCRETE BUILDING IN COURSE OF ERECTION AT CORNING, N. Y.

ABOUT FOUR O'CLOCK on the morning of December 15, the watchman at the Wing & Bostwick concrete building, in course of erection at Bridge and Pulteney streets, Corning, N. Y., while on the third floor attending to the fires kept for the purpose of drying out the cement, was startled by a portion of the cement roofing falling. The watchman ran for the ladder leading to the ground and made record time in descending, barely reaching a place of safety when the rear wall and from twenty to thirty feet of the roof and that same area of the floor space on the three floors crashed into the cellar.

The rear of the building today presents a sorry appearance, with mesh wires and steel cables hanging to the walls, and with cement clinging in patches to the wires and cables.

Since the sub-contractors abandoned the work on the building, October 1, the work of building has been in charge of a Mr. Johnson, of Waverly, representing the contractor, J. D. Calkins, of Columbus, O. Until Mr. Johnson has looked over the ruin wrought by the accident, Messrs. Wing & Bostwick will be unable to tell whether an attempt to repair the damage will be made at once.

The loss by the collapse will amount to several thousand dollars and will fall on the contractor, J. D. Calkins, who is under bond to protect Wing & Bostwick for a period of five years after the completion of the building.

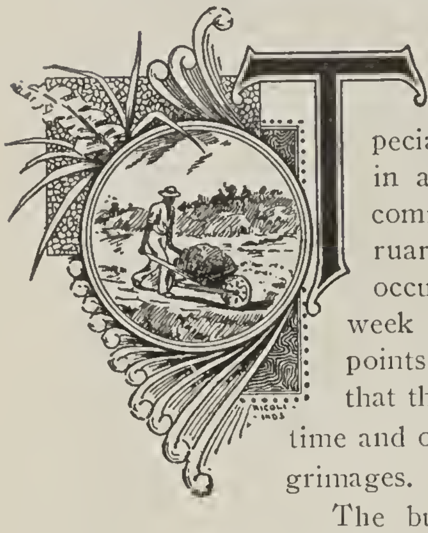
Before this last accident occurred the big building was in a fair way of completion, the basement and first floor being nearly ready for occupancy. A fireproof vault had been placed on the first floor, and the plumbing and steam heating were nearly finished. Even though the damage should be at once repaired the store will probably not be ready for occupancy before the middle of February.

The cause of the accident is attributed to the drying out by artificial heat of the cement of the roof, which was constructed during frosty weather and which crumbled from the heat of the fires in the building.

MEC.

CINCINNATI THE CONVENTION CITY.

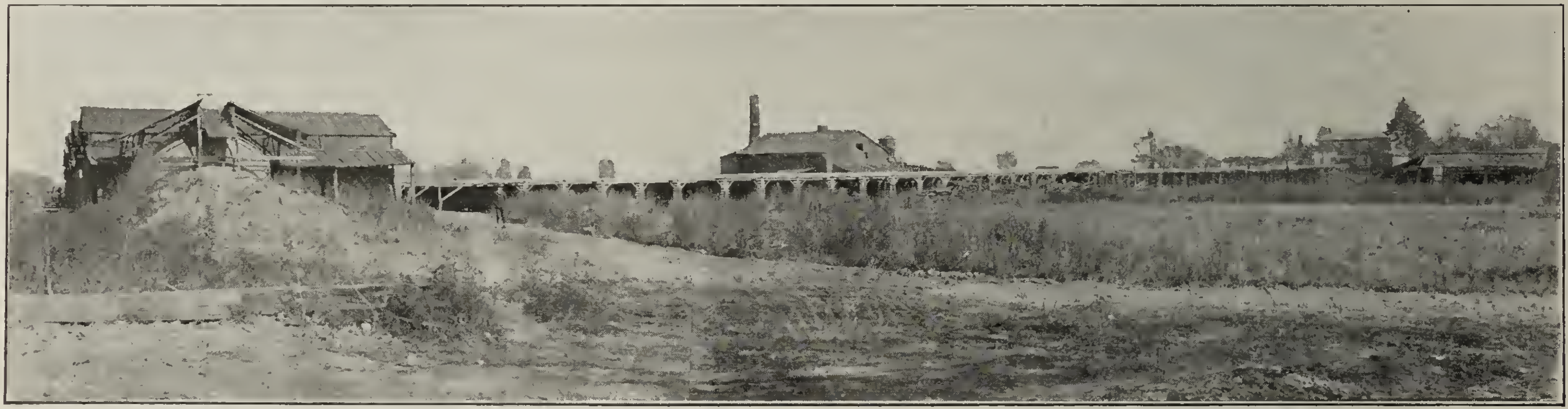
The Brick Plants Which Furnish the One Indestructibie Material For the Building of the Great City.



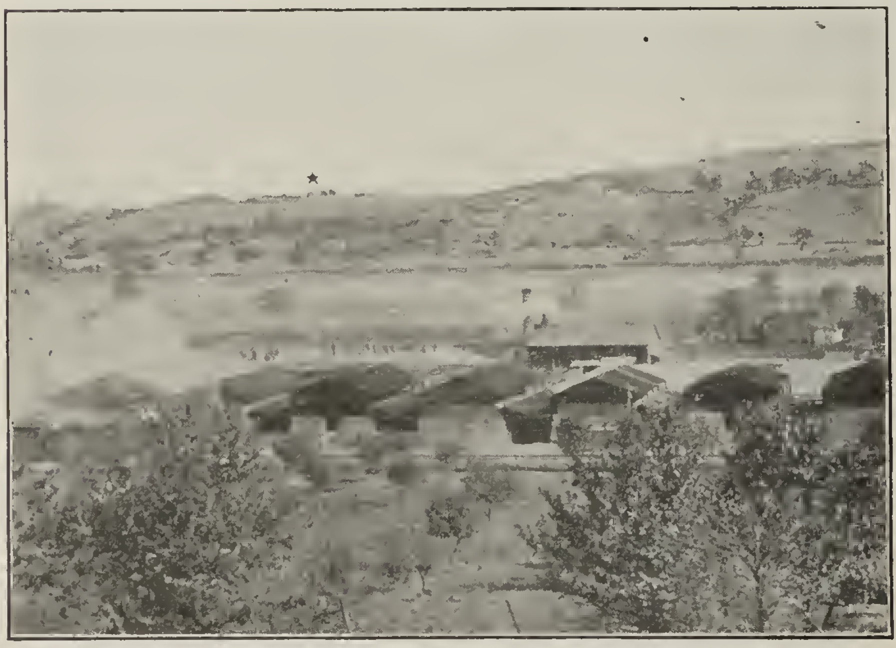
THE MEMBERS of the National Brick Manufacturers' Association are especially interested in the brickmaking plants in and about Cincinnati, where the forthcoming annual convention is to be held February 1st to 13th. The convention proper occurs February 3d to 6th. The second week will be devoted to side trips to such points as the delegates may care to visit, so that those who are so inclined will have ample time and opportunity for a series of brickyard pilgrimages.

The building brick plants of Cincinnati are with one or two exceptions, summer yards, and of course shut down during the winter months. There are a number of other clayworking establishments, however, which will be in operation and to which visitors will be welcomed. The Rookwood Pottery is among them, of course. Of this, our readers are told on preceding pages. Another large establishment within the city limits, which runs the year round, is that of the Charles Taylor & Sons Co., manufacturers of fire brick, locomotive tiles, etc. The plant is located on Burns street a very short thoroughfare in the manufacturing district. It is reached in ten or fifteen minutes by one of the trolley car lines which pass the Grand Hotel.

A Group of Kentucky Brickmakers.



General View of Busse's Brick Plant at Mentor, Ky.



Bird's Eye View of above Plant. The Star Indicates Where Ex-President U. S. Grant was Born, on Ohio Side.

The business was established in 1884, and has been carried on ever since by the senior member of the firm, now deceased, and his sons. The plant lays no claim to architectural beauty, but good ware is made economically. They have good switching facilities, the clay being brought from their mines some thirty miles up the river, where they have a new and modern plant, of which they are really proud. Both plants will be in operation convention week. The city plant is equipped with one Monarch soft mud machine, and one Boyd dry press. The large portion of their product is made by hand. An interesting feature of the plant is the engine which furnishes the power. It was bought second-hand in 1864, was at once installed, and has been in operation ever since. Their up river plant is located near Portsmouth, 106 miles north of Cincinnati on the Norfolk and Western Railroad.

Portsmouth is a very thrifty little city and is destined to be quite a clay center. It is the home of the Portsmouth Pressed Brick Co., of which H. S. Grimes is president. Their plant, while small, is well equipped. They are now making vitrified brick exclusively, averaging about 30,000 a day. These are dried on hot floors, and burned in both round and square down-draft kilns.

—The Peebles Paving Brick Co.—

A larger and more interesting plant, because recently constructed, is that of the Peebles Paving Brick Co. This is in many respects a model paving brick factory. It is reached by trolley car, which connects Portsmouth and a suburban town. It is located on a branch of the Norfolk & Western Railway, the plant lying between the tracks of that road and the Ohio River. They make paving brick and block exclusively and at present have a capacity of 60,000 per day. They have installed a waste heat dryer supplied by the American Blower Co., with which they are much pleased. The flues leading from this dryer to the kilns are all underground. The kilns are of the square down draft type and are of a very substantial character. Indeed, every thing about the plant is first-class and built with a view to doubling the capacity when trade conditions justify doing so. This will probably happen the coming season. The plant will probably be continued in operation right through the winter. Here too, any of the delegates to the convention who may care to look through the plant will be more than welcome.

As we have said, Portsmouth is a thriving city, and her "fathers" are wise in their day and generation. Appreciating the superior qualities of brick pavements and the great advantages of using home products, they are paving their streets with brick. No asphalt or wood block fancies have been indulged in, and as a result, what improvements have been made, are of a permanent character. The tax-payer is getting his money's worth, and as time goes on he, more and more, appreciates the stability, cleanliness and economy of good brick streets in connection with which there are no repair bills. It is a wise city father who clings to that which is good and turns a deaf ear to the promoter of experimental or short lived improvements.

Those bent on inspecting paving brick plants will find several well worthy of careful scrutiny, within easy reach of Cincinnati, and those familiar with Ohio plants and their location will gladly make itineraries for delegates who contemplate side trips.

—Cincinnati's Building Brick Plants.—

Crossing the river at Portsmouth, and catching a westbound train on the main line of the Chesapeake & Ohio R. R. at South Portsmouth, one can catch a fast train bound for Cincinnati and stopping at Mentor, inspect the excellent building brick plant of the Busse Brick Co., which started there in 1892. It is a soft mud plant, a Horton equipment having been installed in 1900. They make 30,000 brick a day and ship entirely by rail. It is a summer yard, using rack and pallet system of drying and was closed down for the winter late in the fall. They have a splendid clay bank, in which they have used a Marion Steam Shovel to decided advantage for some years past.

Unloading Blair's Brick Barges.

A Load of Flower Pots.

Busse's Muffle Kiln.

Carting Brick from Yard to Kiln.

The Water Wagon at Blair's Yard.

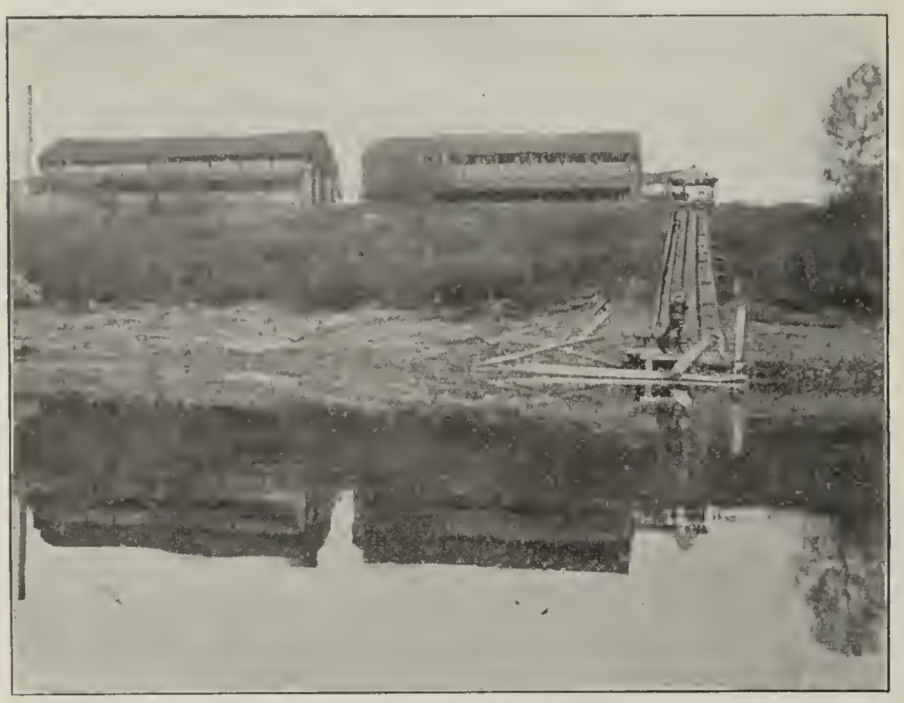
As a side issue they also manufacture flower pots, of which they make about 100,000 a year, ranging from two to sixteen inches in diameter. Those of from 2 to 4½ inches are made on a machine, the larger sizes are made by hand. They contemplate installing the machine made by the Rockwood Mfg. Co., Indianapolis, cut of which appears on page 142, the coming season, as they can make larger sizes on that. The pots are burned in round up draft or muffle kiln and are nested. That is, the small pots are placed in the larger ones.

—A Profit Sharing Experiment.—

This company also operates a soft mud yard in Covington, where they make 25,000 builders a day during the summer season. About one-half of their total product goes to the Cincinnati market, the balance being used in Covington and Newport. When the elder Busse, who established the business, died two years since, he stipulated in his will that the plant should never be sold to or be operated by a trust, and made provision for a mild method of profit sharing with the employes of the company. His wishes have been carried out in this respect and the experiment has proven very gratifying. The workmen are notified that those who continue in the employ of the company will receive such portions of the profits at the end of the season as the returns from the business justify. In 1902, the workmen who had proven faithful received 8 per cent. of the aggregate of wages which they had earned, and 1903, a similar division was declared. This enables them to keep their best men, and the Busse's consider it a good business policy. The distribution is made in the second week of January each year.

Again journeying westward on the C. & O. one might stop at New Richmond, and crossing the river to the Ohio side, catch a trolley car, and ten or fifteen minutes after doing so, land at Blairville, where Cincinnati's largest building brick plant is located. The plant was established in the seventies, and the general arrangement was planned by B. W. Blair, under whose direction the plant was completed and operated for a number of years. On the death of Blair Senior, who was one of Cincinnati's pioneer contractors and brickmakers, his three sons, J. M., B. W. and Joseph, continued the business under the old firm name of the J. M. Blair Brick Co. In 1898 a dissolution of partnership was decided upon and the plant was placed in the hands of a receiver by whom it has been operated ever since, J. M. Blair being retained as general manager. The plant is fortunately located for shipment by boat during navigation periods, being located on the bank of the Ohio River. Unfortunately, they have no railroad facilities, so that when the river freezes over, their shipments must cease until the spring thaw out.

They have nearly 100 acres of good clay ground, the bank averaging twenty-five feet in depth. A Marion Steam Shovel is used in the bank, this yard being the first, it is claimed, to use one of these monster diggers for brickyard purposes. The clay is hauled to the foot of an incline in cars, from whence it is carried bv a Link elevator up to and dropped into a Potts disintegrator, and from that goes into a pug mill which feeds it into a Chambers machine. They have two of the latter, each having a capacity of 65,000 brick per day. The Blairs were among the first to use the Chambers Machine, and so secured the exclusive right to use it in two counties on the Ohio side, and the two on the Kentucky side of the river.



J. M. Blair,s Son's Plant, Photographed from River.

Blair's Gravity Incline.

From the machines the bricks are placed on iron pallets and carried to a flue heated floor dryer of 50,000 capacity. In fair weather when this is filled, the balance of the days run is placed on wooden pallets and taken to outdoor racks of the ordinary type. The brick are burned in Wingard kilns. They watersmoke with coke for about six days and finish with coal in about eight more, the total average time being fourteen days. From the kiln the brick are taken in barrows, run on a gravity incline and loaded on to barges, of which the company own a half dozen or more, each having a capacity of nearly 200,000 brick. These are towed to the company's wharves near the foot of the suspension bridge. A trolley ride of a little more than an hour takes one back to Cincinnati, the cars running every half hour.

—George H. Bruns's Plant.—

A model little summer plant is that operated by George H. Bruns, at Brecon, a station fifteen miles out on the electric line. A switch from the C. L. & N. R. R. affords excellent shipping facilities and the entire product of the plant goes by rail to Cincinnati and towns adjoining it on the east. Mr. Bruns started making brick in 1887. He had previously been engaged in merchandizing, and his health failing, he took to brickmaking as a healthy out-door occupation, and found in it both health and wealth. His experience demonstrates that good business ability and close attention will bring success in the brick business despite a lack of practical experience. That Mr. Bruns is broad-minded and enterprising is evidenced by the fact that he has been a regular attendant at the National conventions for ten years or more.

Again Mr. Bruns is in poor health, and is seriously thinking of closing his yard and moving to California for a year or two, or until he recovers his old time vigor. It is a valuable property, and presents an attractive opening for a young man desiring to get into the business for himself. The plant comprises sixty acres of good clay and farm land. The clay averages some ten feet in depth. It is gathered in scrapers, hauled onto a platform and dumped through an opening in same on to cars which are drawn by cable up an incline and dumped into a feeder and granulator and thence into a storage bin, from which it goes to a Potts disintegrator and then into an Arnold-Creager S. S. machine, to which is attached a Potts Mold sander.

Mr. Wm. Mitchell, of Aurora, Ind., and his Carefully Piled Pallets.

Mr. Bruns thinks he is gathering his clay a little cheaper than any of his competitors, one man and one horse being about all that figures in the expense of that part of the work. It is certainly a simple and effective method of getting in clay. Mr. Bruns for several years has averaged three to four million brick for the season. He could easily make more, but he figures that it is better to make that quantity at a profit than to make double the number and market them at cost, or less, when the wear and tear on machinery and equipment is considered.

The plant is equipped with racks and pallets for drying and four up draft kilns of 360,000 capacity each and one square down draft kiln of 100,000 capacity. The latter is used for hurry orders. It can be burned in less than half the time it takes to finish one of the other kilns. The latter averages any where from ten to thirteen days, owing to weather, etc. He used to watersmoke with coke, but during the past season or two has used coal exclusively.

—The Westwood Brick Co.—

This company's plant is located in the suburb from which it takes its name. It, too, may be reached by trolley in a twenty to thirty minute ride from the Grand Hotel. The plant was built in 1891. It is a well planned, substantially built plant, the machine equipment consisting of the usual steam power plant and Creager disintegrator and pug mill, and Grand Automatic machine, on They have four up-draft furnace kinls, of 300,000 capacity each. The product is shipped entirely by rail. Harry C. Creager is the general manager of the plant, with offices in the Union Trust building.

—Hoosier-Buckeye Plants.—

Those who attend the convention from the West, via the Big Four or B. & O. Southwestern roads, will catch fleeting glimpses of a number of good brick plants, located on those lines, close to which are made about 30,000 brick per day during the summer. the border line of the two States. Just before reaching the Ohio line, they will pass through Lawrenceburg, Ind., a prosperous Hoosier town, on the outskirts of which is located the parent plant of the Mitchell Brick Co., operated by William and Selwyn Mitchell. The former needs no introduction to N. B. M. A. members for he has not missed a convention since he joined the Association at Old Point Comfort. Commenting on this, he said, "It took Mr. Bruns a long time to convince me that there was any direct advantage in attending the convention, but after my first meeting, I was converted, and do not expect to miss another convention as long as I remain in the business, for there is both pleasure and profit in these meetings to any progressive brickmaker."

The Cincinnati Brick Co.'s Clay Bank.

This, their Indiana plant, makes from three to four million per year. It is equipped with a 50-horse power engine and boiler, and Potts disintegrator which feed direct into a Hercules machine, made by the Horton Mfg. Co., and with which Mr. Mitchell is much pleased. The brick are dried by rack and pallet system and burned in permanent walled up draft kilns, with coal exclusively. The same company operates another and a similar plant just over the line at Delhi, Ohio. The latter was built in 1895, and is admirably arranged and equipped. Mr. Selwyn Mitchell gives his special attention to it. The Mitchells are thorough born and bred brickmakers, their father having devoted most of his life to the work. They make an excellent grade of red building brick, most of which go by rail to the Cincinnati market.

—The Cincinnati Brick Co.—

On the same railroad lines is located the Cincinnati Brick Co. The plant was established in 1880, and was known at that time as the Southern Ohio Brick & Tile Co. This is the plant with which the worthy first president of the N. B. M. A., W. A. Eudaly, was connected, when the original National Convention met in Cincinnati, September, 1886. In 1888, it was purchased by the present owners and rechristened the Cincinnati Brick Co. Mr. N. C. Powell, the present general manager, is an experienced brickmaker, in fact has been in charge of this plant since 1890. As will be seen by the accompanying photograph, they too use a steam shovel in their clay bank, which runs from twelve to fifteen feet in depth. Their mechanical equipment was furnished by the Penfield Company, now the American Clay-Working Machinery Co., consists of a granulator, pug mill, and an end-cut machine with a capacity of 50,000 per day. During the past season, they have slowed down to a daily capacity of 30,000 to 35,000. They burn in up-draft kilns and ship by rail exclusively. The average price for building brick the past season has been about $7.25 per thousand on board cars.

General View of Bruns's Yard at Brecon.

Mr. Bruns and His Clay Bank.

—Stedman & Co. at Aurora.—

Those who visit these plants had better take a fast B. & O. train from Cincinnati to Aurora, Ind. When they get off at the station, they will be but a few steps from the shops of Stedman & Co., manufacturers of clay disintegrators and pulverizers, where all visitors will be extended a cordial welcome. Here they can take the back track via trolley cars, which pass each of the Indiana-Ohio plants named.

—The Brickyards on the Hills.—

All Cincinnatians glory in the beauty and picturesqueness of their hill tops. Here are located the famous Art Museum, Zoological Gardens, and the palatial homes of the wealthy. Here, too, will be found a couple of brick plants owned and operated by the Suer Brothers. At one plant they make stiff clay brick, with a Wonder equipment from the shops of the Wallace Mfg. Co., Frankfort, Ind. At the other they make soft mud brick on a Monarch, from the shops of the Wellington (Ohio) Machinery Co., averaging 25,000 a day at each plant. Both are now shut down for the winter.

There are a number of small hand plants scattered through the bottoms and along the river, but the plants named furnish the bulk of the brick required for the building of Cincinnati, amounting all told to about a hundred million brick per annum.

—Clay Plants at Newport, Ky.—

Like its Kentucky sister, Covington, Newport, Ky., supplies a part of the brick required for the Cincinnati market. Newport is a flourishing city of 30,000 people, lying south of Cincinnati and east of Covington, the three cities being divided by the Ohio and the Licking Rivers, the latter flowing into the former at this point. If the beautiful snow, which now covers Mother Earth, disappears in the meantime, delegates to the convention will find, if they take a trolley ride over into Newport, that she has many excellent brick paved streets. She also has, but a short distance from the heart of the city, a new enameled tile plant, operated by the Alhambra Tile Co. The superintendent and manager, Mr. John F. Sheehy, is a modest gentleman, but if any of the visiting clayworkers desire to visit it, they will find the latch string on the outside. It has only been running a little more than a year, but in that time has established a place for itself in the manufacture of enameled wall tile.

There are four brick plants in and about Newport, which are similar in equipment to those on the Cincinnati side, excepting that of the Newport Brick Co., which is a new concern established within the year. They are picturesquely located, well up on a great hill where they have a fine shale bank. The builders had it in mind to make pressed brick exclusively, and so installed a Boyd press, with the necessary auxiliary appliances. Unfortunately, however, they build common up-draft kilns. They now realize, however, that this was a mistake, that press brick should be burned in down-draft kilns, and are now building round kilns of that type. When fully equipped with same, they expect to have smooth sailing.

At the Plant of the Westwood Brick Co.

From Kiln to Car, at Westwood.

General View of the Plant of the Batavia Brick Co.

An Old Time Down-Draft Kiln at Batavia.

Cincinnati is quite a press brick market, and with a view of meeting this demand, a company was formed some years ago and established an excellent plant at Batavia, a thrifty village twenty-four miles east of Cincinnati on the Norfolk & Western Railroad. The plant was well equipped, a Boyd press was installed, and down-draft kilns built, but it has never been operated continuously or up to its full capacity, owing to the fact that the principle owner, Mr. Jamieson is a banker, and not a brickmaker. At the present time, the plant is being managed by his son, P. F. Jamieson, but even he cannot give it his undivided attention, as he is cashier of the bank. They have about concluded that a wise plan will be for them to get a practical press brick man to run the plant and do nothing else. This undoubtedly would prove a wise move,

for they have plenty of good material, excellent shipping facilities and a demand for all the brick they can make.

From all this, the reader may readily imagine that for clayworkers looking for information, Cincinnati and her environments offer a very fruitful field, for no matter what kind or character of brick information may be desired, it may be found there or thereabouts.

CINCINNATI'S BRICK STREETS.

Cincinnati has a few miles of very good brick streets, so good that in all probability the taxpayer as he realizes the advantages of these streets from an economical point of view, will demand more of them. There is one little strip of pavement which ought to serve as an effective object lesson in this connection, for it demonstrates that paving brick are just as durable and better in the smoothness of the driveway afforded than granite block. The strip of pavement referred to is that laid in front of the Chamber of Commerce building on Fourth street. It has been down now for several years, but it is in good condition, notwithstanding it is subject to excessively heavy traffic and those who drive over it must perforce, observe the absence of the jarring and jolting they receive in driving over the adjacent granite blocks. Possibly the average citizen does not realize that this pavement is of brick, but thinks it is an especially fine piece of granite construction. The writer was deceived in this way until he scrutinized the pavement closely.

Considerable work of an excellent quality has been done during the past few years in the residence districts on what is generally known as Walnut Hills, as the accompanying photographs will prove. These brick are laid on concrete foundations with a sand filler. At the time the

Excellent Brick Pavements in Cincinnati's "Hill Tops." Montgomery Boulevard and Vicinity.

pictures were taken (October, 1903) they were smooth and clean and bore no evidence of wear whatever. It is no exaggeration to say that if these pavements are let alone, they will be in good condition twenty years hence, without causing any expenditure whatever for repairs in the meantime. When it is remembered that either asphalt or wooden block, which are really the only competing materials, would not last that long if fenced in and subjected to no traffic whatever, it would seem that the taxpayer would not be slow to choose brick streets. He must do more than this, however; he must demand that the city officials, who control these matters, give consideration to these points. When he does this, brick streets will become the rule rather than the exception, as they are at present in Cincinnati.

NEW YORK BRICK MARKET.

How the Brick are Taken to the Metropolis—Troubles Incident to the Loading of Boats After the Close of the Making Season.

WINTER HAS SET in and completely closed navigation. The last two barges went out on the 14th of December, neither one fully loaded, as the captain would not take the chances of another day's waiting to fill up. It was good judgment, too, on their part for that 24 hours' wait would have left them here for the rest of the winter, for the next day the river was closed. There is no set time in the brickmakers' calendar when he will not ship any more brick. He has, the last few years, had to hold on to his stock in the hope that there would be an advance in price, and if there was, it came so late that he had to try and market stock in any class of barge he could get or take the risk of being frozen in. It is a trying time with the brickmaker after he is all through burning, when a boat comes to the yard to load. It will keep him busy for a while to get men to help load her.

It would seem that where there are a number of yards there would be men enough to attend to all boats which come in, but not so. Most of the married men look up work as soon as they are through on the yards, so that it is a regular chase to get enough to make up a gang. Some cannot toss out and others cannot wheel, and if they can, they take a look at the size of the barge, if its a large barge—they'll have a lame back or wrist. When a boat carries three or four hundred thousand and men are paid 25 cents a thousand for loading and the men that are in the kilns are good and lively brick handlers, the wheelers are kept on a jump, as the time taken is their own and they work for all they are worth.

Outside barges or those which are engaged in other lines of trade have but one man aboard them. The manufacturer is expected to furnish men to stow the brick and charge the cost to the owner of the boat. It is a very difficult matter to get men to do the stowing and it is a case of taking any kind or class of men that can be had. Possibly two out of four may be able to handle brick fairly well, the other two would not be hired at any price—if any one else could be found. After the barges are loaded, unless the brick run uniform, the top and sides of the deck load is a sight. The heads will be as crooked as a farm fence that has been in use many years. As for topping out to make the brick look uniform, they will make it look more like a barber pole. All sorts and colors will intermingle, as it takes a good brickhandler to stow away a load and only put good uniform colored brick on the head and top, and when the cargo reaches market and the buyer sees the shape it is in, he will try his best to get a little off on the ground that if the inside brick are like the top and sides, they are far from good.

A few days since the owner of one of the yards loaded a boat and he had to take such men as he could get to stow her. When loaded he telephoned his agent that she was loaded and to see if he could not place her before she left the yard, saying, "I do not want her to go to market if you can help it, as she is badly stowed and when you send another barge, send one that has a crew, as I cannot get men to stow her, except a few who botch the job horribly."

Shipping by water for this season is done, that side of the trials and tribulations of the brickmakers life is over for a short spell, to be resumed as soon as clear water is at hand and the market call is strong. In all probability, as in years past a clear river may be in February.

Thieves visited five of the brickyard engine houses in the early part of December and removed all parts that had any brass attached to it, oil cups, injectors, and whistles and any pump which had a brass stem to the piston, that was also removed. No greenhorn had a hand in that job. Someone who was conversant with machinery, without doubt, was the master hand. It was a clean sweep, whoever did it, and without a doubt by one man. For that class of work no required time is specified, as after the engine is laid up, no one goes near the engine house except there is something stowed there. The ground has been bare so that tracks did not show.

—Building Statistics.—

Comparison between the years 1902 and 1903 in the number of permits issued, does not show any great advance in the number of buildings. As to cost, quite a margin is in evidence.

For 1903, there were up to December 24th, 1738 permits granted.

For 1902, there were up to December 24th, 1669 permits granted, showing for the present year just 69 more permits than last. The total cost of projected buildings for 1902 was $87,632,067, and the cost for 1903 was 80,924,644, a difference in value of over six million. The total cost of alterations for 1903 was $10,872,342, for the year 1902, $9,251,720, a difference of over one million in favor of 1903. The two years have come out nearly even as to consumption of brick. It is remarkable that 69 more permits to build should be granted in a year when the building trade was passing through a strike, the like of which had never before been experienced. It is disgraceful to the men who have cried for unions, for the action of the unions in New York City shows that even life was not to stand between them accomplishing their end. Muddy water will clear itself in time, and become just as good as at the fountain head. Just so the trouble in the building trade in New York will clear itself and go on a basis that it never before stood—but at what a cost.

—The Brick Trade—

In all its branches, ornamental as well as common, on Tide-water has New York as its market and the past summer has shown how they have been handicapped by those who should do all they could to advance it.

Those engaged in the manufacture of brick were complaining that there was not as much building as there should be and the blame was placed in all parts of the building trade. This summer the overworked horse gave out and those who were crying aloud against the dull seasons year after year were brought face to face with conditions of things that they had not heard of. The time has come and by the exposure that has taken place, all those who deal in brick have been benefited. It should have occurred years ago, but better late than never. It seems impossible that the exposures have come out of the condition of affairs in the building trade. Within two weeks on two distinct jobs, dynamite was used. Guards were placed on all buildings in course of erection. There was not a minute, night or day that someone was not watching the entrance to those buildings, fearful that a crash would tell of another attempt to hinder the work with dynamite.

—Labor Union Atrocities—

The Employers' Association is guarding as safely as possible the work being done to frustrate the plans of the band of desperate men obeying the slightest whim of their leaders. When Sam Parks was walking down the railroad track from the station to Sing Sing, to begin his two years sentence, he half muttered to a reporter of one of the largest New York papers, "I'm done, I got all that is coming to me." A few days since it was made plain why Sam Parks stopped fighting. In the possession of the Employers' Association, the Iron League lawyers and individual members of the organization, they have five thousand type written pages which unfolds the history of the secret service section of the League, which dealt with plots to murder and distroy, with ninety different cases of assault with organized bands of men to maim or intimidate. The doings of the wrecking crew is shown for the first time in these pages. It tells how the wrecking crew of the Parks union was organized, how composed, how it worked, from whom, in a general way it received its orders, and how they were executed. That this same crew, although its leaders are in the stripes of a convict, is still in existence can be shown by reports no older than a few nights since. That their operations are limited is due to perfect protection afforded for both men and buildings on the one hand, and fear of the law on the other. That the slightest relaxation of vigilance on the one hand is expensive is shown by the two attempts to dynamite two buildings in one night, while on three nights ropes were so weakened that great derricks fell.

Loading Brick Schooners at a Brick Yard on the Hudson River.

The secret service section of the Employers' Association was formed to find out the bolder plans of the Parks faction and in a general way learned much that was going on. The way the gang worked was to hammer or batter up a man in such a way that he could not tell who did it. In one case on Brooklyn Bridge, one man was set upon in the rush of the passengers getting from the cars and when he got out he was almost beyond recognition. In the space of two months there were eighty-nine other assaults in New York City. In about forty-five of the cases arrests were made, and not a half dozen convictions. The Employers' Association could not disclose its hand by bringing forward the men that heard the confessions, and the sufferers themselves would not push their own cases. At this time the crew developed a disposition to do up some of the employers, and the one who fell under the ban was the head of a construction company, an elderly man, worth millions. The orders were to beat him on Broadway as he came out of the Townsend Building, the Association headquarters. Four of the wrecking crew were to do the work. Their plan was to rush down on the man as soon as he appeared, then work fast with hands and feet, then separate and take chances. Ten minutes before this plan was to be carried out, it became known. It was after ten o'clock at night, and the four men were at their stations ready. They started forward as their man appeared, but as they did so four men turned the 26th street corner and joined the intended victim as in conversation and accompanied him home, as they did for weeks afterward.

Fifty-Second Street Pier, North River, where the Brick are Taken from Boats.

The secret service of the Association no doubt has done much toward saving money, as well as exposing much which would never have been known. There was a plot to remove the president of the International Iron Workers, Frank Buchanan, at the convention at Kansas City, not by ballot, but by a means whereby he would have no more use for unions. The wrecking crew were to get in some of their fine work. A personal difference between the president and the secretary brought on the trouble before it was ripe, but on the floor were three of the wrecking crew ready to do their work, and in another room was a dozen men ready to frustrate their first move. After the secretary's assault on him, Johnson, to the surprise of all present ran out of the hotel hatless and bootless, and they let him get away as the other side did not want the crew to see how strong they were.

From that time on until Buchanan left the Kansas City Convention, he was never without protection. Forces were redoubled September 10th because it was known that Parks's last throw would be made there. How it was made, explains for the first time why it was that Assistant District Attorney Rand later sent to the Kansas City Police a telegram which told them that certain men were on their way heavily armed ready to make trouble. These men it was reported later, were searched by the police on their arrival, and nothing was found on them. The Kansas City police revealed the telegram and the crew were informed on their way west. Then it was that the new knife and revolver purchased by each on the day he left New York City was passed over to a friend, and when the police met them they were harmless. Is it not a terrible state of affairs in this section and probably in all cities of the land.

Evidence cannot all be revealed, no, not one quarter of that which was accumulated by the secret service of the Employers' Association during the building strike. It is so inseparably connected with names of individuals and places that it cannot be used without seriously compromising some valuable sources of information. The plot to kill Buchanan was revealed late at night and Mr. Rand was informed of it in time to warn the Kansas City authorities. The wrecking crew was seen to purchase its weapons and its plans were fully known. The above statement was made by Chas. S. Eidlity, president of the Employers' Association.

With such a condition existing and gradually getting worse from year to year, is it any wonder that the brickmakers had, to some extent, suffered by such conditions. May the year of 1904 be one of increased prosperity, as Parks and some others are safely anchored behind the walls of Sing Sing Prison.

—The Brick Market—

Closed at prices which have ruled for some weeks, with all getting as many brick down the river as they could. The Upper Hudson closed early, and the result is that the prices have been running from $7.00 up to $7.50. However the weather has been so cold that brick could not be laid, which makes conditions in the favor of the buyer. A. N. OLDTIMER.

December 30th, 1903.

Will Double Capacity.

Editor CLAY-WORKER:

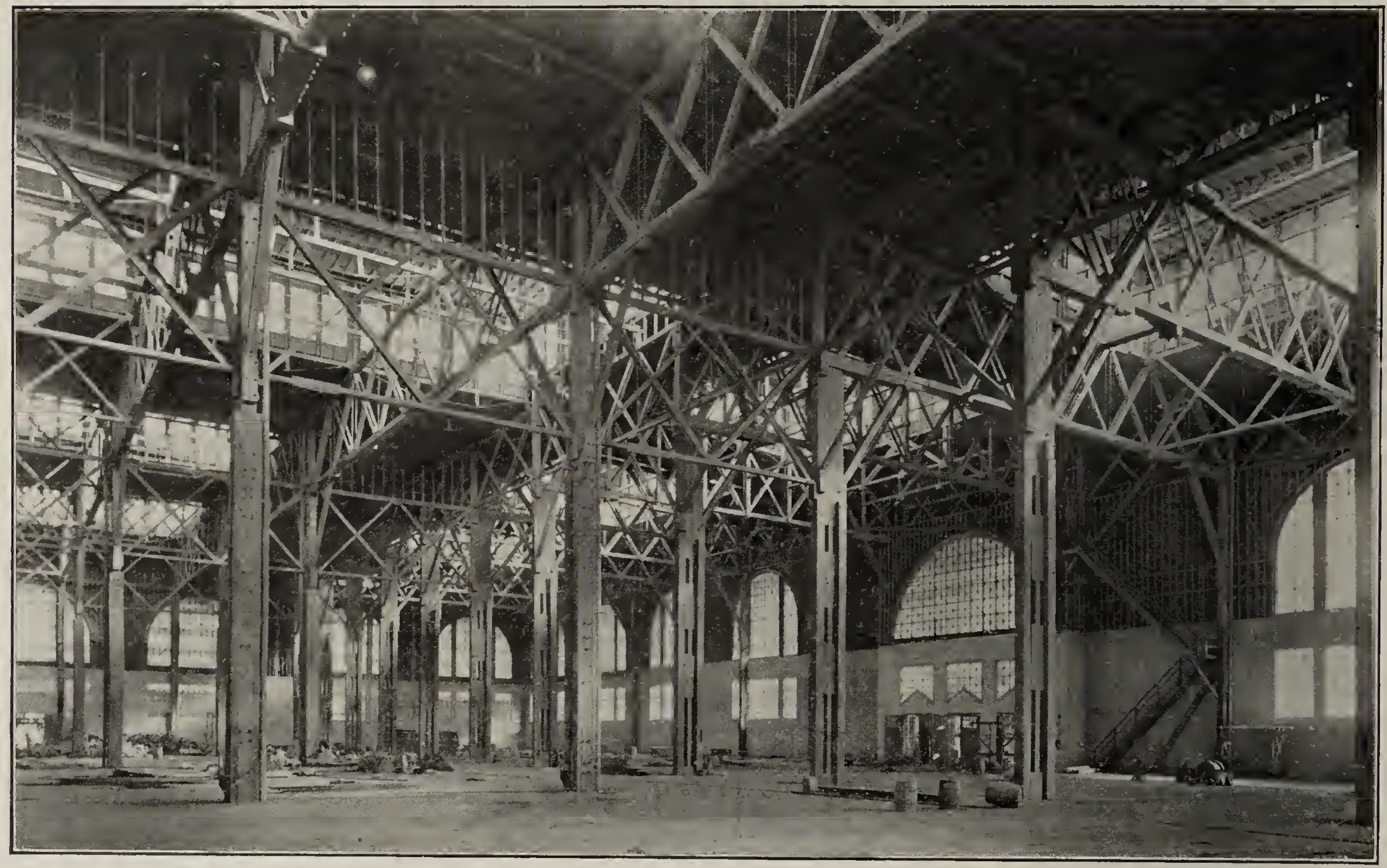
Enclosed find express order for two dollars to pay our subscription to THE CLAY-WORKER for the year 1904. I must say we are very much pleased with your paper, although last season was the first we ever manufactured brick. We had a very successful season, thanks in part to THE CLAY-WORKER, and intend to double our capacity the coming year.

Portage la Prairie, Can., Dec. 29th. A. SNYDER & CO.,

CLAY EXHIBITS AT THE WORLD'S FAIR.

Space Now all Taken and a Great Display Assured.—The Opening Will Occur April 30, 1904.

THE BUILDINGS of the greatest exposition are rapidly approaching completion, some of them have been ready for a considerable time, with the floors swept and the doors locked, ready to open upon the arrival of exhibits. This includes the largest of all, the Palace of Agriculture, with its eighteen and a half acres of floor space. There is not the slightest probability that any of the buildings, whether of the main exposition, the State or the foreign buildings, will fail to be ready in time for the opening, the 30th of April next. This date, the 30th of April, is appropriate and seasonable. Appropriate because the treaty transferring the Louisiana Territory to the United States was signed at Paris, April 30, 1803, and seasonable because the ideal weather of St. Louis begins about that time. The formal transfer of the territory was finally made at St. Louis, March 10, 1804.



Interior of Mines and Metallurgy Building, St. Louis World's Fair, where the Clay Exhibits will be made.

Our exhibits, by which we mean the exhibits of our craft, the multitudinous products in which clay is the main component, will be seen collectively in the 20,000 square feet of space allotted to us in the Mines and Metallurgy Building. A photograph of a corner of the space, where the exhibits of the clayworkers will be, was taken for THE CLAY-WORKER January 8. This shows that in the Mines and Metallurgy Building, too, the exhibits may be installed as soon as desired.

There was a time when it looked as if the collective clay exhibits would not be so full nor so complete as desired, for notwithstanding the fact that, with unusual liberality, the exposition authorities gave the space in all the buildings free, many clayworkers seemed to hesitate about incurring the necessary expense for installing and maintaining their exhibits, but that hesitation no longer exists for the applications for space are in excess of the available area, although the covered promenade, or loggias, around the Palace of Mines and Metallurgy will be used for exhibits in addition to the 20,000 feet of area inside the building.

All lines will be represented, from high art pottery to common brick, including stoneware, enameled brick, fireproofing, clays, spar, etc. Machines will be represented inside by models; processes in operation will be shown outside.

These collective exhibits in the Mines and Metallurgy are under the charge of the committee appointed by the National Brick Manufacturers' Association, of which committee Professor Wheeler is the chairman and does all the work. Exhibitors will have to pay 30 cents per square foot for special expenses, such as care of exhibits, dusting, etc. It has been suggested by several men having experience in these matters that 30 cents per foot will not cover the expense of caring for exhibits during the whole period that the show will be running, but Dr. Holmes, Chief of Mines and Metallurgy, has stated that this amount shall not be exceeded, so that exhibitors are guaranteed against any further charge. The 30 cents per foot is not paid at once, but in three installments. The first payment of 10 cents is now due. The greater number of exhibitors have paid the first installment, some paid several months ago, at the time of making application for space. The second installment will be due May 1st, and the third and last installment on July 1st. In connection with the disbursement of these special expenses Messrs. T. A. Randall and Edward Orton, Jr., have consented to act with Victor C. Heiks as an auditing committee.

For all the prematurely hostile criticisms of disappointed architects at home, or jealous men of France, we are convinced that the completed picture of this greatest World's Fair will far surpass all its predecessors in beauty, even Chicago, as much as it surpasses them in extent. We are making the comparison with Chicago, which, up to the present time, remains in the minds of all beholders as the most beautiful creation of man. We take no account of Paris, which was a great straggling layout on a makeshift site, though when we speak of the greatness of the Paris show it should not be forgotten that our Exposition at St. Louis this year is four times greater in extent than that at Paris in 1900.

The Palace of Mines and Metallurgy, which is seventh in order of size, covers an area 525x750 feet, or nine and one-tenth acres. There are four main buildings of similar size, these are the Palace of Mines and Metallurgy, the Palace of Liberal Arts (in which the dedication ceremonies last April were carried out), the Palace of Education and the Palace of Electricity, each of which has an area of nine and one-tenth acres. It does not seem inappropriate in this place to mention that the total area of the twelve main palaces of the exposition is no less than one hundred and twenty-eight acres. This leaves out of the count Festival Hall, the Administration and ten other buildings, such as Anthropology, Physical Culture, etc., besides the

Main Entrance Mines and Metallurgy Building, World's Fair.

forty-three State buildings and the twenty-two foreign buildings, and then there is The Pike.

Referring again to the beauty of the Exposition many of the buildings will elicit and will be worthy of general admiration, but it is likely that the Mines and Metallurgy will be admitted to be, not only beautiful, but the most original in design.

The Palace of Mines and Metallurgy will not alone be the largest structure that has been provided for these exhibits at any exposition, but it will be exceptionally attractive to every one interested in the development of our country, and notably to the capitalists seeking for opportunities to invest and looking for hints that will assist them to wise decisions. Not the least valuable of these hints will be offered by the many exhibits of clay products, machines and kilns, and the processes and machinery for the manufacture of refractory materials for metallurgical purposes, such as fire bricks, crucibles, retorts, gas generators and furnaces.

A Fine Brick Plant on the Pacific Coast.

Editor Clay-Worker:

Enclosed find two dollars for another year's subscription to The Clay-Worker. We look forward to its coming each month wth a great deal of pleasure. I am sending you a photo of my yard as it was last October. I have a soft mud horse power Diamond machine, which is made and patented in Los Angeles. At present I am building sheds and making pallets, and will put in a gasoline engine. I recently bought out my partner and am now running the plant alone. Anticipate a good season the coming year.

Martin Kelsch,

Santa Barbara, California, Dec. 11th, 1904.

General View of Martin Kelsch's Brick Yard at Santa Barbara, Cal.

Great Activity and New Yards Planned.

Editor Clay-Worker:

I have been a little slow in renewing my subscription to The Clay-Worker, but been busy and just neglected it.

There is a new brick plant going in here which, when completed, will have a capacity of 60,000 builders per day. Mr. Mitchell is the promoter and largest stockholder in the enterprise. They will use natural gas for fuel. There are two other plants talked of, but as yet have not reached a point of certainty. I am promoting one of them, which I think will materialize by spring. There is great activity in the brick business here and brick are commanding good prices.

M. E. Ward,

Ind. Ter.

Written for The Clay-Worker.

MILWAUKEE BRICK AND BUILDING NEWS.

THE BUILDING STATISTICS for Milwaukee for the year 1903 showed up handsomely with material gains in all lines. The aggregate amount of money expended in all building operations reached the sum of $8,775,583, an increase of $622,403 over the preceding year and making the biggest showing since 1892. The gain in the erection of factory buildings was particularly noticeable and is a gauge of the remarkable growth Milwaukee is experiencing as a manufacturing center, the increase being 27.65 per cent and representing a total expenditure of $3,047,910. In this class of structural work of course the use of brick, stone and cement was very general and was largely responsible for the very active demand for brick and other clay products which characterized the entire twelve months of the year.

In the statistics of manufacturing industries the output of brick makes a very good showing. Nine brick, cement and plaster manufacturing concerns produced an output valued at $1,324,000. In these concerns 625 men were given employment and received in wages $291,400. There has been such an active demand for brick that the local yards have confined themselves almost exclusively to supplying it alone.

Reports from the Board of Public Works show that during the year there were twenty-seven miles of streets and alleys improved. Of new brick pavements there were 49,102 square yards at a cost of $102,097.09. An aggregate of 58,813 lineal feet of cement curb and gutter were laid, costing $24,655.39 and 71,941 square feet of cement sidewalk, by the city, at a cost of $8,488.07.

The outlook for the present year is very bright so far as Milwaukee is concerned. The extent to which the manufacturing industries are growing—aggregating an output valued at $251,810,927 last year—indicates that there must be large additions to many already great factories, many new ones and homes for the rapidly increasing number of operatives.

A number of Milwaukee brick men are making plans to attend the Cincinnati convention of the National Brick Manufacturers' Association, including surely George Schwarz, of the Ricketson & Schwarz Company, and quite likely Clifford Chase, of the Chase Brick Company, Henry Taylor, of the W. G. Taylor Company and one of the Burnham brothers.

There will be quite a general attendance of the Milwaukee contingent at the annual meeting of the Wisconsin Clayworkers' Association to be held at Portage in March. They say that the Racine manufacturers will ask that the next convention be held in their city.

The Whitewater Tile and Pressed Brick Manufacturing Company is doing a very satisfactory business. They own fine beds of clay at Whitewater, near the tracks of the Chicago, Milwaukee & St. Paul Railway, and are selling all the white brick and red sand brick they can manufacture. They are also large manufacturers of drain tile, vitrified sidewalk brick and hollow block.

The Wisconsin exhibit of clay products at the St. Louis Fair will be very comprehensive if present plans are carried out. It is proposed to make it a complete exposition of the different kinds of clay to be found in this state and also of the manufactured product in all forms of brick, tile, terra cotta, pottery and cement.

The Burnham Brick & Supply Company, recently organized, is pleasantly located in the Sentinel building and is looking for a good share of business to be had in this vicinity during the present year. Among the concerns they are representing are the Pick Brick Co., West Bend, Wis.; Bradford Pressed Brick Company, Bradford, Pa.; Tiffany Enameled Brick Co., Momence, Ill.; Mound City Roofing Tile Co., St. Louis, Mo.; Wheeling Corrugating Company, Chicago; Mackolite Fire Proofing Co., Chicago; American Plate Products Co., Indiana; Western Roofing & Supply Co., and others. They will also do a general business in lime, sand, cement, fire brick, fire clay, etc.

A BADGER.

FLORIDA'S LARGEST BRICK PLANT.

An Important Industry In the Land of Flowers.

THE McMILLAN BRICK COMPANY of Pine Barren, Florida, is the largest plant of the kind in the State. The plant has been in existence for fifteen years, but three years ago it was put under the management of Mr. W. P. Brownson, who has been responsible for its prominence in the manufacturing field of Florida.

About $15,000 to $20,000 capital is invested and $5,000.00 annually is spent for fuel alone. The product is sold to points in Alabama and Florida, while a very large export business is done in Mexico by way of Mobile. The quality of the brick is unsurpassed for building purposes, and nearly every prominent lumber company in Florida demands it for use in building their dry kilns. The clay pits seem to be practically inexhaustible. About fifty men are employed and $2,000 a month is paid out for labor. Ample shipping facilities are afforded by the L. & N. R. R., the switches of the railroad running into the yards of the plant in front of the kilns. The company owns their own switches. At the Pine Barren plant there are about thirty acres, but the company owns yet another plat of 500 acres. In the thirty-acre tract a small portion of it is dug down to about eight feet, yet $30,000 worth of brick has already been secured from it. There are two acres under the sheds and capable of holding 200,000 brick in process of drying. The kiln capacity is 650,000. The plant takes the slab output of two saw mills, which they use for fuel, all of which is hauled by rail; besides which they contract for hauling wood and also operate their own teams for the same purpose. The value of the yearly shipments of brick from the McMillan Brick Works is at least $30,000.

It is interesting to watch the process of brick making at this plant. As the brick comes out of the die it is as smooth in appearance as marble, free from all pebbles and iron, and with a glistening surface. There is no doubt but this brick is the finest made in the south.

Worth Twice the Price.

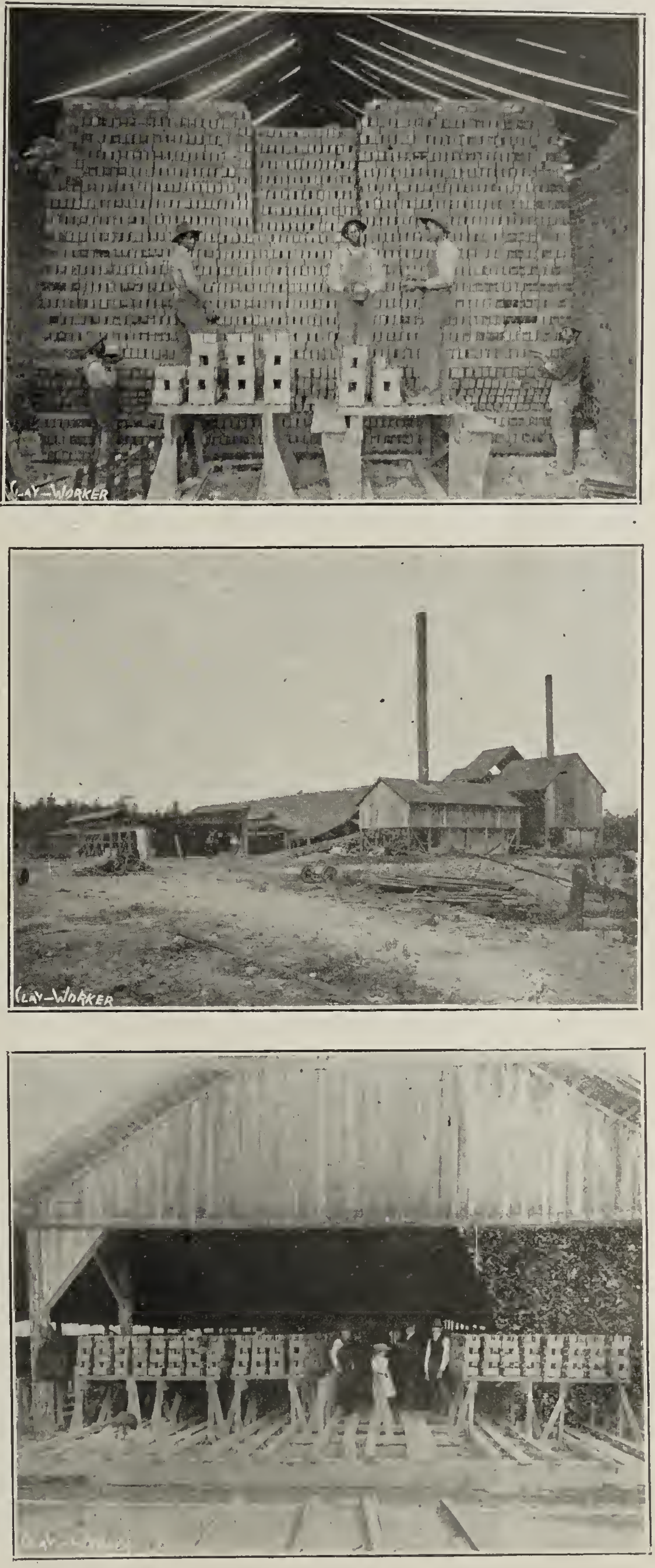
Editor CLAY-WORKER:

Enclosed please find $2.00 for your valuable paper for the year 1904. It is worth twice the price and we enjoy reading every issue. We believe every year you make it better than the previous. Keep right on in the good work. Your fellow townsman, Mr. Albert Potts, stopped over in Syracuse the other day, but we failed to meet him, which we regret very much. We believe Indianapolis is a great city and we like to meet her people.

Syracuse, Dec. 28th, 1903. C. H. MERRICK,

DAVIS BROWN'S CHANGE OF BASE.

It is announced that Mr. Davis Brown, who has been representing the Chambers Bros. Co., at Chicago, has resigned his position and will go to Iowa and take charge of an electric light plant. In speaking of the change, Messrs. Chambers Bros. say, "We are sorry to lose Mr. Brown, for he has been very faithful and attentive to his duties. His new position offers wider opportunity for his abilities. We feel sure that the same industry and faithfulness which has characterized his work for us will bring him success in his new undertaking. At least, that is our earnest wish. He will be succeeded at Chicago by Mr. E. R. Frazier."



Glimpses of the McMillan Brick Co.'s Works at Pine Barren, Fla.

Written for The Clay-Worker.

BRICK AND TERRA COTTA IN PHILADELPHIA.

THE OLD YEAR which we have buried beneath the weight and load of jovial gayety, was somewhat human by the decree of comparison. It had its feast and period of indigestion, striking it in the steel ribs of its make-up, toward the end of the year, when after an acute attack along in October, it became an invalid at its finish and was finally buried with many sighs and groans of anguish, by those who had suffered most, by the dropping out of their much vaunted stocks.

Aggravated somewhat by the sympathetic strikes, our brickmakers looked forward to having a slump, fortunately, however, the architects and real estate operators came to their rescue, their small reserve stock was soon depleted and there was nothing else for our clayworkers to do, but go ahead, and accumulate brick and wealth together.

Murtha & Early.

Holding well the key to the northwestern section of the city, have had a busy year, maintaining an average good price on hard and salmon. Some of the larger operations and contracts, calling for lots running all the way from a million and a quarter to four million, with a result that their output for the year will foot up nearly twenty million. When seen on the 5th, both partners were enjoying their matutinal cigar in a temperature of 75 degrees, utterly oblivious of the fact that it was only 8 degrees above zero outside. With them it becomes a question merely, whether they can get away from the Convention with sufficient money to go to California. But be at the Convention they will.

H. C. Carroll & Sons

Were busy hauling even to late in the afternoon of the 24th. Quoting Peter Carroll: "The year has been a good one, and we have much to be thankful for. Our output for the year will be in the neighborhood of thirteen to fourteen million. Much work has been operative, and as a consequence, the many strikes touching the larger buildings has not seriously interferred with us. We have all the clay we want well housed, our men well satisfied. There's nothing I crave for tomorrow, but a light fall of snow, so that our children may have an excuse to wear their new rubber shoes." With an invite to jump in and be driven back to the center of the city, I take a snap shot at him as he leans waiting patiently for the roan mare to be buckled up.

The Real Estate Operations

For the year of 1903 show that the spirit of progression is on, in the staid city of the Quakers, as well as typhoid fever. Five thousand six hundred and sixty new buildings have been erected at a cost of $27,612,625, supersedes any previous year. And bear in mind that this is exclusive of the cost of land. Also that it means 875 more new buildings were erected than in 1902, when the total estimate of the brick output was over two hundred million. Two thousand, one hundred alterations also opened up a big gap for the disposal of many fancy brick, hand made and stretchers. Thus far I have not been able to make up a table accurate, for the total output of brick for the past year. Will endeavor to have this ready for the next issue.

The ensuing year will make a heavy demand upon our brick yards for sewer brick. The underground Rapid Transit has already opened the way, and miles and miles of underground clay and gravel has been thrown up on the surface, ready for that period when its arches can be sprung and the brick buttered into place. In addition to the foregoing, plans have been prepared and ground will be broken as soon as this hard spell of frost is broken. A new theatre will rise at the corner of Third and Arch streets. This is designed to accommodate about 1800 persons, and to be built entirely of brick and terra cotta, absolutely fire proof, we are assured—so was the other, but let that pass. Thirty exits are planned, but will they be opened when wanted? There, that's the question.

McAvoy & Morris

At 26th and Wharton streets, have justified the expression made by men who know they would make a "good team." Young, aggressive, and not afraid of hard work, they claim an output for the past year of over ten million, and all good stuff.

The Conkling-Armstrong Terra Cotta Co.

Has had a busy year, the many orders crowding their facilities, and thus compelling them to remodel and enlarge their mammoth plant at Wissahickon. The new extension running 150 by 60 feet, now gives them in the main working building, a length of 250 feet by 60, three stories high. In the third floor, the remodeling has necessitated a change of the draughting room, the plaster and the modeling rooms, and also permits the introduction of electricity to supersede the old steam power, and the many hundred feet of belting, which only served to shut out the necessary light.

On the ground floor, a new seven foot dry pan has been installed by the American Clay-Working Machinery Co., and a rehabilitation of the old pug mill. The engine or power room, has been overhauled; the donkey engine has been done away with, and a Watertown, 75 H. P. boiler and 50 K. C. C. dynamo, making 280 revolutions per minute, installed to give heat, light and power. Adjacent to this, is a brand new Albro-Clem freight elevator, and throughout this section everything glistens with virgin like purity. At present they are busy on the plans prepared by Architect Burnham of Chicago, for the new store erected for John Wanamaker, between Eighth and Ninth, Broadway and Fourth avenue. This new edifice will have a frontage of 327 feet and a depth of 339 feet, with a rear of 188 feet. Running up thirteen stories, ten stories will be solid brick and terra cotta. Corbels, string courses, arches and medalions of fine classic design. The interior will also be strengthened by the best brick, terra cotta, fire proof material, and embellished with the best terra cotta ornaments rich in allegorical design.

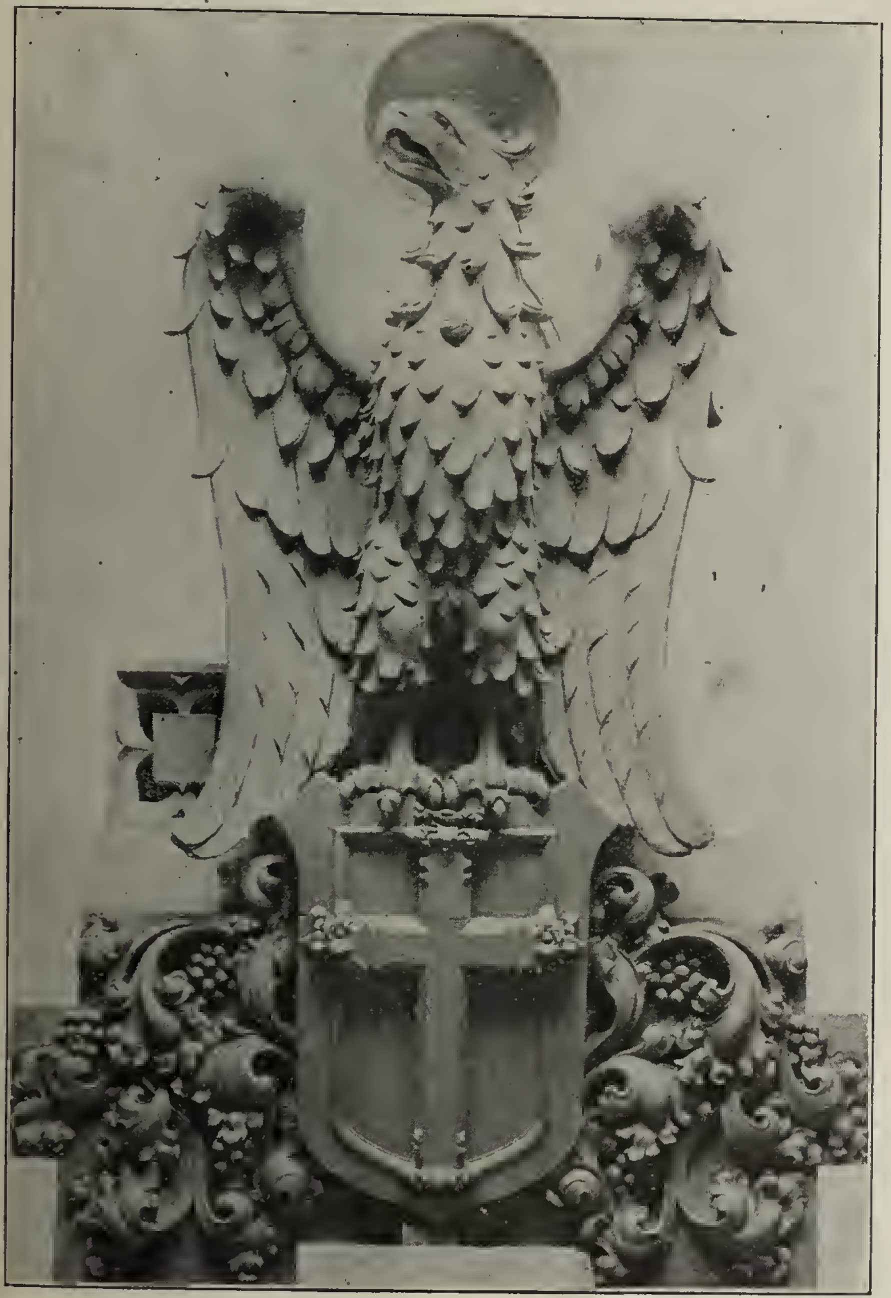
Peter Caroll, "Waiting for the Roan Mare."

On the fourth floor, measuring 65 feet by 61, will be a music hall, adaptable as a theatre whenever occasion may need. Light wells and peak houses on the roof, larger than an ordinary country residence, will give both fresh air and light, thus rendering it one of the few places, where patrons and workers may thrive without fear of suffocation. This structure will take up miles of terra cotta work, and in every section of this big plant, one is confronted by huge blocks of malleable clay, ground down and modelled into every conceivable form, allegorical, human, animal and classic. Every year witnesses some improvement in the lines of modeling.

One cannot deny credit to the worker, the modeller of the cold clammy stuff, the inherent right of the artist to some recognition for the taste displayed.

No longer dismayed by the many hundred feet of facial nakedness, the terra cotta workers have jumped into the breach, to support the brick man, proving by all powerful argument that the stone cutter is not the only one who can embellish a mammoth building or city residence. Weather proof, and fire proof resisting, it serves to broaden the channel, that all resisting, will give the keynote to municipal beauty in the days to come.

From Federal buildings to sky scrapers, from churches to theatre, from railroad and steamship terminals to residences, the future for brick and terra cotta in buildings will be as the "sine qua non" of food and drink to the people of the earth. Beneath the crockets and spire of St. John's church at Jacksonville, Florida, the influence of earthly beauty in conjunction with temperal aspirations, is marked by the reproduction in acanthus, cross shield and eagle dominating, and the heraldic Griffin, clawing in accentuating agony the ridge lines, in mute appeal for public recognition.


Terra Cotta Finial, St. John's Church, Jacksonville, Fla.

Symbols, past and present, finger marks of history, will be written in terra cotta upon the walls, indicating to our successors, the achievements of our times, in Science, Music, Art and Literature.

W. P. LOCKINGTON.

THINGS WANTED.

J. V. McGlesh, Whitesville, Tenn., writes that he would like to correspond with builders of up and down-draft kilns, and also with manufacturers of sand-lime brick machinery.

The Dillonvale (Ohio) Brick and Tile Company are in the market for a dry press for manufacturing tiles. They also want to build a kiln of 150,000 capacity and would like to correspond with kiln builders.

Written for THE CLAY-WORKER.

BUFFALO BRICK AND BUILDING NEWS.

The Old Year was Bounteous and the New Promises to be More so.

GREETING FROM A BRICKMAKER WHOSE YARD IS UNDER FOUR FEET OF SNOW AND THERMOMETER REGISTERS 42 DEGREES BELOW ZERO.

STATISTICS AT our Bureau of Buildings show that Buffalo did nore business in the building line in the year just ended than in any other year since 1895. During the year 2,011 permits were issued representing an expenditure of $6,263,402.

Among the large buildings in process of construction is the Buffalo Milk Company's plant, capital $3,000,000. The building will be 116x265 feet, located at the corner of Niagara and Massachusetts streets, running right through to Prospect avenue. It will be built of brown Medina sandstone and the rear with buff Pompeiian brick and will cost $300,000. C. H. Woodruff, architect and builder, has the contract.

This Milk Trust is the latest in this city. They say they intend to have the latest scientific machinery for clarification and pasteurization of all milk and cream—also refrigerating and ice making machines—will make butter and about fifty tons of ice cream daily. Buffalo uses 130,000 quarts of milk and 6,000 quarts of cream daily on which there is a net profit of 1½ cts. per quart on milk, and 6 cts. per quart on cream—and the yearly profits on milk and cream amounts to one million dollars. I hope, nevertheless, the readers of THE CLAY-WORKER will not all sell their brickyards, and join this trust—no matter how rosy the figures look.

To return to the buildings. The Larkins Soap Company is going to build two additions to their already large works—one building costing $109,000, and the other an eight story brick on Seneca street, 300 feet east of Larkin street. The building will be 200 feet wide, 152 feet long and 104 feet high to cost $270,000, while the Keystone Warehouse Company's building, Seneca and Hamburg street, will cost $350,000.

The new Lafayette Hotel is being furnished. The Hengere building, on the site of the old Tif' house, is being closed in, ready for interior finishing. It looks like something doing for all our yards, both old and new, for another season.

O. W. Weyer, former secretary of the Buffalo Brick Association, and later builder and manager of the new all-the-year-round brick yard about 16 miles out of the city at a place called Wanakah, N. Y., has recently purchased his partner's interest in the plant, giving the Schaeffer Brothers a mortgage for $61,679.00 for their interest in the property. He has had a good season. One contract with the steel plant called for half a million a month, besides he had to keep Schaeffer Bros. supplied with brick and they use about five million annually.

The Lancaster Brick Co., recently sold out, has been incorporated under a new name—it is called The Lancaster Brick and Tile Co., of Town Line, N. Y.,—and is now owned by C. S. A. Coe, Edward Brown, W. F. Hofheims, Geo. W. Carter, F. J. Garvin and John C. Dingens, all of whom were directors in the old company.

Herr Gustav Voelcker, superintendent of the Mass City Brick Co., at Mass City, Michigan, writes he has had a very good season output—nearly two million. He is figuring on putting in a dryer. He had started to build one, but had to give it up—it started snowing October 26 and it snows more or less every day—says people are not satisfied if they do not have four feet of snow on the level by New Year's day. They store the wagons away in the fall for six months. Sometimes thermometer goes down to 42 degrees below zero. There is one good thing, people seldom die up there, simply dry up and fade away.

The doctors complain that all their cases are from accidents in the mines, of which there are three. The scenery is beautiful and picturesque, but rather lonesome.
NORTON.

Buffalo, N. Y., Jan. 10, 1904.

THE CHICAGO SITUATION.

Bright Prospects for Increased Building Operations During 1904.

ALL SIGNS now point to a more progressive season in building in Chicago during the year 1904 than during the twelve months just closed. The number of building permits issued is beginning to show a slight increase already, indications being that there will be considerable activity in the erection of apartment and office buildings. A permit for the erection of an $800,000 structure, of the latter type granted yesterday.

During 1902 the record for building in Chicago was about 30 per cent higher than in 1903. From present indications, however, contractors and architects predict that the record for the current year will surpass that of 1902. Their predictions are based chiefly upon the fact that cost of construction will be about 15 per cent lower during the present than it was during the past year. This reduction is the result of lowered cost of materials rather than of any lessening in the cost of labor. Wage schedules are likely to remain about as they were last year, but it is believed that the average cost of material may possibly go even lower than is indicated now. The only large consignment of structural steel handled in Chicago recently was a lot of 4,000 tons for two buildings, and this was placed, according to reports, at a price that indicates much cheaper structural work during 1904. Brick in all probability will not go lower than it has ruled for the past month or so. Indeed it may be a shade higher.

These conditions, it is reckoned, will tend to make the activity in building brisker than it has been for some time. The large number of prospective builders, who have waited because of the high cost of material and construction, and who are probably more numerous even than has been estimated, will undoubtedly take advantage of the more favorable conditions. Office space at present is high priced and it is thought that there will be considerable building of this character during the year.

During 1903 a total of 6,128 permits for buildings were quoted at an estimated cost of $34,699,053, the total cost being higher than in any previous years except 1895 and 1902.

THE CHICAGO DELEGATION TO THE CINCINNATI CONVENTION

As convention time draws near, the brickmakers of this vicinity are making plans for the annual trip. Of course, Purington and Gates will be there, and there are a number of others with whom the convention trip has grown to be a habit. S. S. Kimbell, Tom Moulding, H. B. Skeele, Charles Bonner, J. H. Gray, E. H. Moore, Harry Flood, John Moroney, A. F. Barron, are among the regulars, and the rest of the machinery contingent, will be on hand as usual. The delegation to Cincinnati will be large and gay. Nearly everybody is going over the Big Four, for that is the only line out of Chicago to Cincinnati which lands passengers at the Grand Central Station, which is just across the street from the rear entrance to the Grand Hotel, so that by going via the Big Four delegates will avoid annoyance incident to transfers, cold buss rides and tiresome street car trips, both coming and going. Those coming from points beyond Chicago will be more than welcome, and they can add to the pleasure of their trip by joining our delegation. Purington and Gates say that while they are going via the Big Four, they do not want to get mixed up in the matter of reserving sleeper berths, etc. The proper party they say to look after that is the Chicago Big Four Agent, J. C. Tucker, 238 Clark street. The night train which carries through sleepers, leaves Chicago at 8:30, arriving in Cincinnati at 7:10 the next morning. Those who prefer traveling in the day time can leave at 9:00 a. m., arriving at 6:00 p. m., or at 1:00 p. m., arriving at 9:05 the same evening.

Perhaps the greatest triumph of the clay product scored in Chicago during the past year is seen in the terra cotta front of the new First National Bank building. Persons looking at the front of the completed part of the building would not suspect that any portion of what appears to be heavy granite is in reality terra cotta. Yet such has been the development of the product of the North Western Terra Cotta Company that it is able to imitate in terra cotta, both in texture and effect, any color in granite. The granite matched in this case is of a pink color, and the entire main cornice and parapet are made of terra cotta, similar in every respect to this granite. The entire court of this building is trimmed with white enamel terra cotta—millions, sills and lintels—this material reflecting more light than any other. While in all outward appearances there is no difference between the granite and the terra cotta, the latter is much more economical and much lighter, and easier to set in place. In case of severe fire a granite cornice with great projection would be a dangerous affair, while the terra cotta cornice is considered safe. There is no question but that terra cotta is a much better fire resister than granite or stone.
SCRIP.

Chicago, January 10, 1904.

A PLEA FOR GOOD ROADS.

Through Better Drainage.

At the wind-up farmers' institute held at Marshfield, Wisconsin, Mr. Charles F. Harrison, special agent and road expert of the Department of Agriculture, Washington, D. C., said, "While the building of good roads is looked upon as something too great to undertake, it is but a simple thing after all; there are but three things necessary to the work, according to one of the foremost road builders of the day and they can be summed up in one word, viz: 1, Drainage; 2, drainage; 3, drainage. To this, however, should be added 'grading,' for one cannot be had without giving the other. Drainage may be had in two ways, viz: 1st, By surface drainage, by proper shaping and ditching; 2d, underground drainage, by tiling. The cause of bad roads is —water, and water is the greatest coward known; it will always run away if you give it a chance. But too often, we dam it in the roads.

"Ex-State Senator Earle, of Michigan, once got off this toast at a banquet of the L. A. W. in Connecticut: 'Here's to King Mud. Dam him? No. For if you dam him he will grow; ditch him, drain him, roll him, stone him. Then the arch fiend will have to go.'

"When water leaves the clouds it seeks to reach the center of the earth, but meets with obstructions; according to the density of these obstructions, is its capability of getting away. If porous sand and gravel it goes quickly; if of clay it has to be assisted. Earth is composed of voids, if it were not so, air and water could not get in to support plant life; this is as it should be, but in road construction these voids must be filled up or pressed together to keep the water out. It has been found that a cubic foot of earth contains 25 per cent. of voids near the surface, through which water readily passes, but further down there are but 12 or 15 per cent., owing to travel having compacted the earth, making it harder for water to get away. By creating a vacuum, water will flow; by tiling you will have made that vacuum. Of course, having made it, an outlet will have to be provided for the water to get away from the road."

'In this connection we add, that where gravel or crushed stone can not be had at any reasonable cost, the underdrainage of highways is the next best improvement of roads. It is also true that not a well underdrained roadbed will require 50 per cent. less gravel or crushed stone to make a good road."

Written for THE CLAY-WORKER.

CAPITAL BRICK FACTS AND FACTORIES.

IT WAS SAID a year or two ago that clay in the District of Columbia, available for brickmaking, had about run out, and that is one important reason for the establishment, in Virginia, near Washington, of a number of large clayworking factories. But, notwithstanding this, there still is in the District of Columbia in some places, abundant material for clay products. In the southwestern portion of the city, near the eastern branch of the Potomac River, clay is obtained for two factories located in that neighborhood, one a hand-made brick factory, with four kilns of about 1,000,000 aggregate capacity; the other (Monroe's) a machine yard of 32,000 daily output, four kilns holding 1,000,000 aggregate, and steam dryer of 32,000 capacity.

In the northeast section, at Mt. Olivet street and Florida avenue, there is located the large brickmaking plant of Merton & Agnew. Here one finds fine clay in abundance; the landed property consists of 10 acres and it is all clay. The bricks made by this factory are of excellent quality, red (dry) press, arch and salmon. The machinery is inclosed and there is a great deal of it, in fact, I don't think I ever before saw so much machinery in a plant the size of this one.

The machine most in use by the Merton & Agnew factory is a Freeze, with daily output of 60,000; it is driven by four boilers each of 60 horse power, operating a 150 horse power steam engine. The clay is gotten near at hand, four banks, in places thirty feet deep; it is hauled by horse power in steel shovel carts and dumped into a breaker door outside. In further process the raw material is carried up to and through two huge iron drying cylinders, which are heated directly from special furnaces—is ground, and then passes over wire screens which sift it into a large trough.

The screened material is now practically in a dust condition and so enters a chute, thence to pug mill and to brick machine. Coming from the machine molded and pressed the clay is cut by wire-wheel cut-off, and the bricks are run on a system of rail tracks to the dryer, the latter having capacity for 200 cars, each holding 500 bricks and being heated by steam pipes. The water used comes from the city reservoirs—and, of course, the supply never fails.

A part of this factory's equipment is a blacksmith shop, and it has its horses, wagons and stables. A railroad switch facilitates operations by running close to one side of the factory. The clay in and near Merton & Agnew's brick yard is sufficient for years of steady work, and when it is exhausted Washington City will be considerably larger, if it keeps up to its present state of progress or even grows less swiftly.

But when we think of the many thousands of brick buildings in the District of Columbia (between sixty and seventy thousand) it seems a wonder that clay here has held out so well. It is true the half dozen brick companies, at and near Brick Haven, Va., across the river from the Capital City, have, in the past few years, contributed largely to the Washington market; but this city has been constructed principally of clay from its own soil, and that outside the county.

In future, Virginia clay will be used for buildings here more than material of this kind from any other place. Sometime the river may be used as a means of transportation for these nearby Virginia brick factories, for the haul by wagon road is still a dear and tedious process. Mr. John Miller solved this problem by bringing his clay up the Potomac by towed barges and manufacturing it in the city, and now the Hygienic Brick and Fire-Proofing Company is having its product brought to Washington by the water route.

With all the brick factories in and near Washington, at work, the product would amount to something like 800,000 brick per day. And in the spring all will be working; but, as mentioned in my last letter to THE CLAY-WORKER, the outlook for building business in 1904 is not now so cheerful. Expectations are centered in greater measure upon the building work of the Government; and no doubt a great deal of help will come from this source. About $2,000,000 will go into the new D. C. municipal building, or, properly speaking, about $15,000,000—for the site will cost something over half a million dollars. Work on this structure will begin in a few months. Other Government building enterprises are engaging the attention of D. C. brick men and with the building season a few months in the future, it is hoped that investors in brick and mortar may, before spring, get over the little "uncertain feeling" that now disturbs the Washington building business world.

NICODEMUS.

Written for THE CLAY-WORKER.

PROMOTION OF BRICK AND TERRA COTTA INDUSTRIES.

THE BRICKBUILDER library competition is one that is attracting unusual attention, not only among architects and draughtsmen, but among manufacturers of architectural terra cotta and all who have at heart the encouragement of the skillful and artistic use of this material.

The program which was published in the June number of that magazine, called for a structure, two stories in height and covering an area of about five thousand square feet. The exterior was to be designed entirely in terra cotta, and it was suggested that colored terra cotta or faience might be introduced successfully as a feature of the design.

In this program it was stated that one of the chief objects of the competition was to encourage the employment of architectural terra cotta, and that in the awarding of prizes, the intelligence shown in its constructive use would be an important consideration. The prizes, which were undoubtedly an important factor in stimulating interest among draughtsmen and architects were contributed for the most part by various manufacturers of terra cotta, which goes to show that they appreciate very fully the importance of attracting the attention of architects and builders to the possibilities of this material. In this they were remarkably successful, for nearly three hundred drawings were submitted, and the competition has aroused a most widespread interest throughout the entire country.

The prizes offered were three in number, and were of five, two and one hundred dollars respectively. These were to be awarded by a committee composed of three eminent architects and one of the leading terra cotta manufacturers of the country. This was done to insure the selection of designs which would not only be of high artistic merit, but at the same time would be well adapted to the possibilities and limitations of the material in question.

The jury of award was composed of Robert S. Peabody, of the firm of Peabody & Stearns, and president of the Boston Society of Architects; Professor Desire Despradelle, professor of architecture in the Massachusetts Institute of Technology; Chas. A. Coolidge, of the firm of Shepley, Rutan & Coolidge; Clarence H. Blackall, and William C. Hall, president of the Perth-Amboy Terra Cotta Company.

These prizes were awarded some days ago, but at the time of this writing the drawings have not yet been published. The *Brickbuilder* announces, however, that the winning designs, together with some twenty or more others of especial interest and the criticism of the Jury of Award will be published in a special number, which will be issued during the month of January. These drawings will undoubtedly attract considerable interest. The first prize was won by F. C. Hirons, a draughtsman in the office of Herbert Hale, of Boston, and a recent student in the Massachusetts Institute of Technology. The second was given to Calvin Kiesling, who recently won the competition for the Colorado Springs Library, and the third prize was awarded to the drawings submitted by Messrs. Wells, Crowell and Hathaway.

The design submitted by Mr. Hirons is in the style developed by the Ecole de Beaux Arts, and is monumental in character and elaborate in detail. It is interesting to note that in the selected designs practically no limitations in the use of terra cotta are recognized. Mr. Hirons's design, in particular, with its large free standing Corinthian columns might as well have been submitted in a competition for a structure built in stone. The selection of these designs would seem to indicate that the judges feel that what can be built in stone can be successfully and properly executed in terra cotta, and that there is no structural or artistic limitations in the employment of this material.

L. H. G.

CORRESPOND-ENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Always Glad to see The Clay-Worker.

Editor CLAY-WORKER:

Enclosed herewith find check for $2.00 to pay our subscription to THE CLAY-WORKER for another year. We could not do without it, it comes as an old friend, which we are always glad to see. Wishing you a prosperous and successful New Year, we are,

Yours truly BOSE & KASER.

Canal Dover, Ohio.

Finds the Clay-Worker Very Valuable.

Editor CLAY-WORKER:

Enclosed herewith find $2.00 for our subscription to THE CLAY-WORKER. We find the paper very valuable and interesting and look forward to each copy.

In regard to business, we have had a very successful year, having sold all our output long before the season closed, at good prices. We are about 1,000,000 short of what we could have sold. We are now installing a dryer and another brick machine, which will give us a daily capacity of 55,000 to 70,000. By putting in a dryer it gives us a much longer season to manufacture.

RED DEER LUMBER AND BRICK CO., LTD.

Alta, Can.

The Clay-Worker" The Brickmaker's Best Chum"—Kiln Troubles.

Editor CLAY-WORKER:

Enclosed find two dollars to pay for another year. I consider THE CLAY-WORKER the brickmaker's best chum.

Last year we constructed a Stewart Patent kiln, with a capacity of 75,000 common brick. It is something new in our line, and we were not surprised to find the first burn a failure, but were much disappointed when, after several trials, we found it impossible to draw off a good uniform burn. We could clear quickly, but could not in any way, raise the temperature high enough to burn the brickyard. They were always a little light, right straight through. I have been intending to attend the convention at Cincinnati, for light on this subject, but now find that it will be impossible and would like some help through the columns of THE CLAY-WORKER, if any readers have had any exeperience with this kiln. We have a capacity of about 250,000 brick and 100,000 tiles per year, using a Quaker and Kells brick machine. The writer intends inspecting several plants in your State next summer, for the purpose of buying new machinery and getting new methods.

L. E. SHAW,

Novia Scotia, January 4th, 1904.

CONSIDERS CONTINUOUS KILNS BEST.

Editor CLAY-WORKER:

In your October issue are two articles on kilns and burning, both very interesting reading, especially to one in the old country, because, rightly or wrongly, the feeling creeps over us that a question is being discussed that has been settled long ago, i. e., the relative position in a common brickyard of up-draft, down-draft and continuous kiln.

The theory that an up or down-draft kiln of any construction has any chances alongside a good continuous kiln, for economy, we consider is as dead as Queen Anne. All brick kilns may be divided roughly into the three classes above mentioned, though the variations of each kind are many.

For many years the writer has watched the decline and fall of the up and down-draft kiln for common goods. When a continuous kiln has been erected in a district, and neighboring yards have to compete, with the ordinary kilns to burn their brick, they have in most cases either closed down or put up a continuous kiln in self-defense. And then, for more than the one reason of fuel, well arranged continuous kilns can be set and drawn cheaper than well arranged up or down-draft and on a big plant the cost of the burning is also less. On one plant in the writer's knowledge, the cost for labor works out at three shillings per thousand for English-size brick, and sometimes less.

Though there may be many opinions as to the various kinds of kiln for dealing with face brick and terra cotta, yet I think the opinion is that, for economy in labor and fuel, a good continuous kiln takes the cake. A BRITISH CLAYWORKER.

St. Michaels, Old Fletton, Peterboro, England, Dec. 1st, 1903.

THE NATIONAL CONVENTION A FRUITFUL SOURCE OF INFORMATION.

Editor CLAY-WORKER:

I have read and re-read with much interest, the many valuable articles that have appeared in your journal during the past year. It is said though and truthfully so, that "no one knows it all," and this being a fact, it is always a wonder to me that any brickmaker can stay away from the National Convention, for there, and at no other place, that it has been my privilege to attend, is there a better chance for one to get information, than these conventions. Except of course, at our clay-working schools, which in this case is hardly a just comparison, for when a man gets toward fifty years old, he is generally at the time where he has got in most cases, to care for the education of his children, instead of going to school himself. But next to our clay-working schools, is the N. B. M. A., where one can get not only what man knows, but I may safely say, what hundreds of men know, if he can find time to take it all in.

Just to show you for example, in your issue of October last, in the article of Modern Clay-worker No. 9, on the subject of kilns, which is a valuable paper, but when the writer states that in the continuous kiln one loses the waste heat for drying purposes, he is mistaken. If he had said, one loses a part of it, I should have agreed with him. But here comes in the point that I mentioned previously, that no one man knows it all, and the advantages one can get by having these different men who are right in the business, and know what you want to know, and who are willing to give it to you, and you can get it in one week, it is more valuable than I can estimate.

It has been my privilege to see several continuous kilns lately, which after the kiln had used all the heat that it can for burning purposes, there is in some cases 170 degrees, in another 230, and in another over 300 degrees of heat going to waste. This difference is gotten from the material burned, some requiring more heat than others to burn them. I know of one continuous kiln which has a dryer built on top of it, and the regualar exhaust fan system is used to take the heat from the cooling chambers and put it into the dryer, the same as is being done with the down-draft kiln. At another place, they were using the waste heat in the same way only the dryer was on the same level as the floor of the kiln, and along with the waste heat; they used hot air from the exhaust steam from the engine which was conveyed to pipes and the same fan system used as in the other case, and I know of another party, who is constructing a continuous kiln, and is going to put everything that comes from the kiln into the dryer.

The party referred to has, practically, no smoke from the continuous kiln, and has constructed his kiln on the theory that he can use anything that comes from the kiln, in the way of heat, or hot air for drying purposes. He has not built a chimney at all for draft purposes, depending on his exhaust fan to do this. Of course, color in his case cuts no figure, so long as he gets a good hard burn and properly shaped brick, he is all right.

But why should this not be done in the case of paving brick, as referred to in the article mentioned. It is a well known fact that it is not so much a high degree of heat that is wanted in a dryer, as it is to have this heat moving more rapidly than we have seen in some cases. Another matter mentioned in the same article is high installation cost. Certainly this varies in some localities and with some contractors, but as regards comparison with the down-draft kiln, from the kilns which I have built of both kinds, I think the continuous costs less for the same capacity than the down-draft.

The articles entitled "Clay Dust" by A. Lumina, have been very interesting. These are very similar to what any brickmaker attending the National Convention will hear at the buttonhole talks in the halls and lobbies of the hotels, the exhibition room, and if he is lucky enough to get in a room with one bed and three cots in it, all occupied, and with someone who knows more than he does and even if he doesn't know as much, there will be some new points he will learn that he never heard before. In addition to this, will stake my reputation on a box of brick dust, be it large or small, that any brickmaker will say at the end of the convention, if he is in the least receptive, that his short stay with the members of the N. B. M. A. and especially those he has had the privilege to room with, that they are more like brother brickmakers than he ever thought it possible.

I trust Mr. Lumina will continue on the same lines after the meetings that are proposed to be held in Cincinnati, for we have a business unlike all others, in that our materials are rarely the same in any two localities, and many times when we seem to contradict each other, when properly understood and every matter under consideration has been thoroughly looked into, it is like the Good Old Book. What is required of us is a more personal, careful study of all the points that appear at variance and when handled by those who have made it their business to find out, and while in some cases it may not be in accordance with our own ideas, it will be found that there is not such a difference as appears on the surface. It is well to consider and look over our own part of the matter once more and do it with a spirit of trying to benefit the largest number, and in that way we shall come to consider "that no one man knows it all," and we shall feel better for it.
RIP VAN.

A Poor Year but Will Try Again.

Editor CLAY-WORKER:

Enclosed find $2.00 for THE CLAY-WORKER, I would not like to do without it. When I am away from home my wife forwards it to me. We closed our yard in the spring on account of so much rain, getting our clay so wet we could not work it, and when we did get ready to start the bull weavels ruined our cotton crop, and there wasn't any money to do business with. We have a good four mold Berg press and all other new machinery but we didn't make a good season. At first the poor burns got the stockholders impatient. We did burn some nice deep red brick, as good as any one would want, but couldn't get enough out of a burn to make it pay. Will, however, start up again next spring, and hope for better luck.
GUS BIRKNER,
Texas, Dec. 30th, 1903.

NEW METHOD OF MOLDING TEST CLAY BRIQUETTES.

IN LOOKING through the reports on the testing of clays, one is struck by the wide variation in the tensile strength shown by different briquettes molded from the same batch of clay. Since the tensile strength of a clay is at present accepted as the best method of expressing its relative plasticity, it would seem that the more uniform the results obtained in making this test the more nearly would the results express this plasicity. The greatest difficulty in the way of uniform results at present seems to be in obtaining briquettes that are homogeneous throughout and free from lamination. Various methods of molding have been used by different workers but none of them seem to be very satisfactory. The personal element that enters into the molding is so great as to very materially affect the results. So that two persons molding separate sets of briquettes from the same clay are quite apt to get very diverse results, and it is only after considerable practice that the molder is able to get results that are any where near uniform and they are not very satisfactory at the best.

During the past few months, the writer has made a number of experiments looking toward a better method of molding. After a number of failures the following method was worked out.

The clay is first made into a rather heavy slip by mixing either in a ball mill or in a large jar. This slip is then poured either on a plaster slab provided with a frame to prevent too thin spreading, or, if the clay will not stand such rapid drying, into a frame with wooden bottom and permitted to dry as rapidly as it will stand without checking until it reaches the condition of a rather stiff mud. It is a good plan either to make the frame sections or to cut the mud into strips by passing a sharp spatula around the sides of the frame and through the body of the mass in such a way that the strips shall be about an inch wider than the briquettes are long. By this cutting the clay is given a chance to shrink without irregular cracking, and more of it can be utilized in making briquettes. The briquettes are now cut from the strips with a tin cutter made just to fit the inside of the brass mold. The cutter is about two inches deep with a hole in the plunger of the constant pressure machine. Handles of wrapped wire are soldered across the curve of the cutter and a thin block is fitted into the inside of the cutter to push out the clay. The cutter is filled, inserted in the mold, pressure from the constant pressure machine applied, and the cutter gradually lifted until it is above the surface of the brass mold. The pressure is then removed and the briquette struck off with a fine wire. If the brass mold was well oiled and a piece of paper placed under it before the clay was put in, the mold with the enclosed briquette can be carried to some convenient place for drying and the briquette slipped out without opening the mold and without in the least, distorting the soft clay.

The constant pressure machine is a simple home-made affair but quite effective for the purpose. A small pine box was taken, a hole bored in the bottom, a rod passed through this hole and fastened to a cleat nailed across the top of the box. The box was filled with sand—about fifteen pounds is used—and suspended from the ceiling by a cord and pulley. A light frame was now made with two cross bars at different heights from the table and holes bored in these bars the size of the rod used. This frame keeps the weighted box from tipping while pressure is being applied in molding the briquette.

The whole outfit—drying frames, cutter, pressure machine, and all—can be made for not to exceed two dollars.

It might seem at first that molding briquettes by this process would be a long and tiresome task, but that is not the case. By any method the clay has to be first uniformly mixed and the softer the clay the easier that is done. After the slip has become stiff enough for molding, a set of fifteen briquettes can be made in considerably less than half an hour.

Some of the advantages of molding by this process are that the briquettes are perfectly homogeneous, do not show a trace of lamination, the person doing the work need not have had any experience, and finally but most important of all, the briquettes break more uniformly than those molded by hand by an experienced workman.
HARRY B. FOX,
Instructor in Geology, University of Illinois.

The Rust Clay Feeder.

We introduce to the clay industries a new candidate for trade favors, the Rust Clay Feeder, which will prove a valuable accessory to many plants. Many of the troubles to which clayworkers are subject are the direct results of irregularity in feeding clay to the machine. The Rust Feeder will obviate all this, besides putting the clay in much better condition for the machine. It is automatic and therefore a labor saver. It requires little power and scarcely any attention after once being properly adjusted. For full particulars, see ad. on page 127, or better, write the Gemmer Engine & Mfg. Co., Marion, Ind., for descriptive circular.

Holiday Offerings.

The Glover Machine Works, Marietta, Ga., manufacturers of light locomotives, has favored us with a very pretty wall ornament with thermometer attachment, a very acceptable souvenir.

The Thew Automatic Shovel Co., Lorain, Ohio, remembered us in a substantial way. Their holiday greeting being accompanied by a fine fountain pen. If any of our subscribers chance to get duplicate bills, they will know that our Thew pen is working overtime.

The Standard Dry Kiln Co., Indianapolis, is sending to their friends and patrons a very handsome and useful gift in the form of a memorandum book. They will be pleased to send one to any reader of THE CLAY-WORKER who will send them his address —so long as the supply lasts.

The American Belting Co., Youngstown, Ohio, remind us that Alpha canvas belting is still in the lead, by sending to the editorial desk a handsome pocket match case bearing their compliments and a well delineated view of their traveling salesman in hot pursuit of an elusive buyer. It is a ten to one shot that he gets him. They have a series of window transparencies of a similar character, which are very pretty and which they will be pleased to send to those of our readers who will write them for same.

The machine which does not answer your purpose may be just what some one else needs. Tell the "needee" about it in a card in the "For Sale" columns of THE CLAY-WORKER.

Written for The Clay-Worker.

TOLEDO BRICK AND BUILDING SITUATION.

THE BRICK BUSINESS in Toledo and throughout this section has been very dull during the past several weeks, especially since the holidays. The cold weather has put a stop to all progress in the erection of large buildings. The prices of different grades of brick have not changed from that published last month, viz., $6.75 for builders and $7.25 for all hard brick. All plants are now closed down for the winter; even the Ohio Brick Company's plant, which was kept in operation up to the first of the year, is closed down.

Irving Macomber, of A. E. Macomber & Co. proprietors of the Auburndale Brick Works, stated to The Clay-Worker representative that he did not look for brisk business during the coming year. He furthermore stated that he did not anticipate the brick business would suffer from labor troubles, as it did last spring. He also stated that he did not look for many big building projects to materialize during the coming season, in view of this being the presidential year.

W. A. Howell, of the Collingwood Brick Company, and also president of the Toledo Brick Supply Company, said—"Business is dull and the prospects for the future are not very promising. In fact, I believe business will not be as good during the coming season as it was during 1903. Deliveries for the month as compared with the same period last year are thirty per cent. short."

The plant of the East Toledo Brick Co., Gates Brothers, proprietors, which has been idle for the past few years, has been sold, and the plant will be moved elsewhere. The name of the purchaser and the location of the plant is being withheld for the present; however, it was positively learned that the plant will be moved away from Toledo.

The Toledo Brick Supply Company held its annual meeting the second Wednesday of last month, and re-elected its officers for the ensuing year.

Burton C. Ames, of the Toledo Building Inspector's office, informed your correspondent that very few permits are being taken out for buildings at the present time. During the month of December only sixty permits, mostly for residences, valuation $103,200, were taken out, as compared with November when fifty-five permits, for buildings, valuation $111,519, were taken out. A permit was issued during December to Oscar Sabin, for a store and flat building, size 42 by 64, to be built of brick and stone, valuation $9,000, corner Bush and Erie streets. The National Supply Company also took out a permit during the month for two buildings, both to be built of concrete, brick and steel. One of the structures is to be 150 feet long by 100 feet wide, two stories high, valuation $10,000—the other buildings are to be erected at the corner of Bishop and Albion streets. The Moreton Truck and Storage Co. will erect a three-story building, 60x64 feet in size, valuation $5,000, at the corner of Thirteenth and Wabash streets, material to be used consisting of brick and steel.

Work on large buildings has been at a standstill for several weeks, in view of the very severe cold weather. The new Masonic Temple foundation has been completed, and it is expected that work on the superstructure, which will be of granite, stone and brick, will be resumed within a short time. Work on the National Union building, which is being built of brick, is also at a standstill.

Prices of paving material have gone up since the first of the year, the advance being $1.00 per thousand on all classes. Harry Jennesen, a prominent contractor, informed The Clay-Worker representative that paving material will be rather scarce during the coming season, and he furthermore stated that contractors are looking for another advance in the near future.

Walter Hudson, Toledo's new building inspector, is vigorously enforcing the law which requires contractors to take out permits. This office was but recently established, and there has been manifest hesitancy on the part of contractors to comply with the building laws. All contractors have received notice that they must comply with the city ordinance.

In the matter of sewer construction, contractors may be compelled to consider another expense in being required to use steel ribs hereafter in the construction of big sewers. The attention of Toledo's chief engineer's department has been called to the matter. These ribs in connection with the use of corrugated metal will necessitate the use of less brick, and it is said the cost of construction will be lowered as much as twenty per cent.

The past few years have witnessed an interesting contest among paving material men. Of the total of 117, 294 yards of paving and repaving put in this last season, the combined vitrified bricks put down aggregated 77,259 yards, costing $138,000, while one Toledo firm, the Lake Erie Asphalt Block Company, made great inroads on the other contractors, securing 40,555 yards of the total paving work, at a contract price of nearly $91,000. This firm is preparing to make a great fight to secure the work of the coming season, and will make a desperate effort to outgeneral other contractors. The Vitrified brick contractors for a time were successful against the asphalt people, but little by little the Lake Erie concern has succeeded in getting a good stand. The firm is very successful in the paving business and their business is rapidly increasing. The years paving shows that the Harris pavers were chosen six times, Logan blocks seven times, Athens block six times, Nelsonville block but once, Wassall twice, Medal blocks once, Iron rock once, Mack block once. There was not any of creosoted wood block put down during the season, nor was there any sheet asphalt. While the expense of paving and repaving for 1903 reached $230,000, Chief Engineer Consaul estimates that about twice that amount will be expended for street paving during the coming year. During the year 34 sewers, with a total length of 39,000 ft., costing a little over $92,000, were constructed.

T. O. D.

CURRENT CATALOGUES.

THE AMERICAN CLAY-WORKING MACHINERY CO., Bucyrus, Ohio, has added to their reputation for the production of high-class trade literature by getting out one of the finest catalogues that has ever come to us for review. It is 10x12 inches, contains 200 pages, bound in substantial tan-colored canvas covers. The title is executed in black and yellow, with a full sized brick embossed in dark red and black. Across the face of the brick is affixed a lithograph view of their two plants, prettily grouped beneath the spreading wings of an eagle, from the talons of which is suspended a keystone bearing their trademark, "Built right, run right." The catalogue is illustrated with a series of fine, lithographic views, and innumerable cuts of their clayworking machinery, which includes almost every known device used by brick, tile, pottery, hollow block and fire clay manufacturers. It is a valuable and costly book. Nevertheless, a copy awaits every reader of The Clay-Worker who will make a request for same.

THE WELLINGTON MACHINE CO., Wellington, Ohio, has issued a new 1904 catalogue. In commemoration of their silver anniversary, the title is printed in silver aluminum on a solid red background and makes a very pretty appearance. It contains illustrations of their Monarch and Quaker soft mud brick machines, which are made in a variety of sizes from a small capacity horsepower machine up to a mammoth all-iron Monarch weighing 14,000 pounds. A line of pug mills, clay disintegrators, mold sanding machines, sand dryers, brick molds, trucks, and barrows, are also shown. They will send a copy free to any reader of The Clay-Worker who asks for it.

ARTHUR KOPPEL, New York City, has issued a supplement to his catalogue No. 77, which tells of their standard track materials, mainly switches and turntables, of which Mr. Koppel makes a specialty. Those of our readers who are not already in communication with him and who are likely to want railway materials of any sort or description are invited to send him their address.

THE AMERICAN BLOWER CO., Detroit, Mich., has added to their large stock of printed matter a dainty little brochure, devoted to their A. B. C. moist air dry kiln. Its story is told very briefly, but in an effective way. Seekers after dryer information should send for a copy of it.

SR. ANTONIO ROCHA, of Havana, Cuba, has contracted with C. W. Raymond Co., of Dayton, O., through their New York office, for the equipment for his large brick plant to be erected near Havana. The machinery equipment consists of a Raymond No. 1 Special Combination Brick Machine and Cutter of 50,000 daily capacity and all other grinding and handling machinery necessary to make the equipment complete. The plant is being engineered by the C. W. Raymond Co. and will be one of the finest in Cuba.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

XLI. JANUARY, 1904. No. 1.

CURRENT COMMENT.

THE CLAY-WORKER has always been a helpful companion and a good advisor.

* * *

It is not what we have done, but what we are doing that counts in the world's work.

* * *

THE CLAY-WORKER'S record is one of unvarying, steady, continuous growth. Each of its busy twenty years has been marked by some advance and improvement. This splendid issue attests that 1904 will prove no exception.

* * *

Our readers are requested to compare this issue of THE CLAY-WORKER with other clay papers. Those who do so, will see for themselves the difference between a real, first-class, up-to-date magazine, and an imitation of same.

* * *

The secret of our constant growth and ever widening influence is a steady purpose, and an unceasing effort to make THE CLAY-WORKER a real help to every branch of the clayworking industries. Our chief effort has not been directed toward securing advertisements, but toward making a journal so instructive and entertaining as to command the confidence, and deserve the good opinion of every one connected with the business.

* * *

How well we have succeeded is attested by this our twenty-first Anniversary issue. It speaks for itself. There is no need for bombast here. We may mention in this connection, though, one unique feature of our business. We have no advertising solicitors and never have had. We know of no trade paper to be compared with THE CLAY-WORKER of which this may be said. We confess that it is a matter of which we are quite proud.

* * *

The rich man's troubles in the Eastern money markets will be helpful to all substantial projects. There will be less tendency to invest in dreams and visions, and a stronger disposition to invest in brick and mortar. Money diverted from non-paying investments will make cheap money and cheap money always means substantial investment in building.

* * *

Are you going to the National Convention at Cincinnati, February 1st to 6th? It will really be time and money well spent.

* * *

Those who contemplate attending the National Convention at Cincinnati will do well to read the Official Announcement on pages 74 and 75. Do not merely glance at the headings, but read it entire and thoroughly, for that is the only way you can familiarize yourself with all the details.

* * *

The sessions of the American Ceramic Society occur Monday and Tuesday, the first and second, with a final session Wednesday forenoon. The Secretary, Prof. Edward Orton, Jr., Columbus, Ohio, will be pleased to mail a complete programme of the events arranged for, on application.

* * *

Several of our readers have recently asked for information relative to details, all of which they have had before them in the Official Announcement since its publication in the November and December issues of THE CLAY-WORKER. Every essential detail is covered in the final announcement in this issue, which we commend to the careful perusal of every reader.

N. B. M. A. CONVENTION THOUGHTS.

The communication of A. Lumina on page 79, in this issue, alludes among other interesting things to the selection of the next president of the National Association, and gives a list of a number of members, any one of whom would honor the Association, if elected to serve as its presiding officer. We believe this is the first time any mention has been made in our columns, in advance of the Convention, of a presidential candidate. We can endorse them all, and a hundred others, equally deserving. There is no question, but that A. Lumina voices the sentiment of the rank and file of the N. B. M. A. in his description of the qualifications requisite for the office. The Association has always been liberal or broad guaged, and few, if any mistakes have been made in the selection of its executive head. In but one or two instances has the office been sought for actively, and in each instance the efforts made were unsuccessful. With so large a number who are competent, deserving and eligible to select from, there need be no fear of mistake at Cincinnati.

THE NEW YEAR AND ITS PROSPECTS.

We are apt to look into the future out of the experience of the past. The dominant incident of last year is pictured in one word—strikes. As we look into the business future of those related to clayworking, we see prospects clouded only by the memory of the past. Those of us who have many opportunities of coming in contact with men of judgment, astuteness and clearness of vision hear only one opinion—that business prospects are exceedingly good providing serious labor troubles are avoided. At the beginning of 1903 building prospects were phenomenal, but they were not realized. The labor element was responsible for this. Those in any way interested in clayworking are influenced by whatever has to do with structural work. It may be the making of steel, the placing of it in position, the work of the carpenter, the plasterer, the plumber, the laborer on the street. the mixer of cement, the layer of brick or the cutter of stone. All of these and many besides were influential in whatever depression was felt by the clayworker during the year 1903. The difference in conditions between the beginning of last year and this year is formed entirely from the experience of the last twelve months. The disastrous effects of strikes as they were eventually realized were not anticipated a year ago. The fear of the present time is based not upon the vision of the future, but rather upon the memory of the past. The labor element regards this question from measurably the same point of view that the capitalist and employers of labor do. The laborer did not realize on the prospect of last year's business. He was merely successful in paralyzing constructive work. He was successful in tearing down and not in building up. He is now without the strength of spirit that was his a year ago. He has the promise of much work at fair wages if he will behave himself. The business of 1904 is dependent entirely upon this question. As soon as it is realized that investment may be undertaken with safety, thus soon will the business of the clayworker be all that we may wish for.

Architects, engineers, contractors, all unite in the statement that the anxiety of the workmen for employment is now in brilliant contrast with the disposition to strike which was dominant in his mind a year ago. Architects and engineers are now busy with undertakings which may be carried forward if only labor will show a disposition to be reasonable. Out of this condition we believe that we will realize a prosperous and successful year's business.

ANOTHER CHICAGO MARE'S NEST.

We wondered not a little at the tardiness of our Chicago contemp's appearance this month, but now that it is out two weeks behind time, the secret of its unseasonableness is made known. It has been incubating. Three months and a half ago, it found another mare's nest—it used to find them quite frequently, but of late has either been less diligent in searching for them, or else has lost the knack. They found another, though, the first of last October, when an article written by the Editor of The Clay-Worker appeared in the *Municipal Journal and Engineer*. After "setting" for three months and a half, it is now able to produce a labored criticism, the real purpose of which is self-laudation. This is so palpable that comment is really unnecessary, but in passing we want to direct its attention to some points of which it is evidently in ignorance. Long years before our co-temporary came into existence, before that second star appeared, which, if we may credit our contemp', made Chicago another Bethlehem, The Clay-Worker began promoting the brick paving industry. It was the editor of The Clay-Worker who wrote the first paper advocating the use of brick as a street paving material—the paper which was read at the first N. B. M. A. Convention at Cincinnati in 1885, and but now published in book form for the first time. Next we published a series of papers by Prof. Ira O. Baker, on the "Durability of Brick Streets." This was the first publication on the subject of brick paving in book form, and after that we gave to the public Wheelers' Vitrified Paving Brick. From the beginning, all through the intervening years The Clay-Worker has constantly and consistently, in season and out of season, led in the work of promoting brick streets. The clayworkers of the country, and particularly those identified with the paving brick industry are so well aware of this fact that the efforts of our co-temporary to appropriate to itself the credit of this work which belongs to The Clay-Worker, and which is bearing such good fruits, will be as futile as all its previous attempts of a similar character have been. The article which has held them spellbound for nearly four months, is a statement that wooden block pavements, *if kept in good repair,* is an ideal pavement for residence streets. Now how many paving brick manufacturers are there who will seriously gainsay this? Some may want to lay special stress on the *if,* but so did the Editor of The Clay-Worker when making the statement to the Editor of the *Municipal Journal and Engineer,* for be it known the paragraph criticised was not correctly printed (as our critic may see by referring to the correction in the November *Eng.*) and was not a part of the original "story," which our co-temporary so graciously admits was ably written. There is nothing gained by refusing to recognize what merit there may be in a competing material. He is very narrow who does that. So long as it remains intact, wood block makes a good pavement. Its most vulnerable point is its lack of durability, but for that weakness, and it is a fatal weakness, wood block would be a very dangerous competitor for any paving material. Regardless of that weakness, it will continue to be a formidable competitor for fine residence streets where wealthy property holders want a noiseless pavement, regardless of cost of maintenance, and are willing to repave their street every three to five years. Now, if our contemp. will incubate some more, we may be treated to another bunch of buncombe in the course of three or four months—it takes time to write these heavy editorials. We await with dread suspense the results of another "hatching."

TWO DECADES OF PROGRESS.

This was a great country twenty years ago, but when note is taken of the wealth, the power, the glory, though they are but outward signs of a nation's inward strength, and comparison is made between today and twenty years ago, it is not strange that the world is lost in wonder at the progress along every line that has been accomplished under the Stars and Stripes. So vast has been our advance that it is too great even to excite the small feeling of envy among the nations, it has compelled admiration in some, notably in one of a kindred race, with admiration has grown a sincere regard.

Wonderful as is the progress of this nation as a whole it is perhaps less than that of our own craft. Twenty years ago, when the first number of The Clay-Worker was issued, the general practice of clayworking was comparatively crude. Rule-of-thumb methods held the place of exact knowledge and what knowledge there was of this kind, was confined to a few, for there were no means to disseminate it until the organ of the National Brick Manufacturers' Association appeared.

The dissemination of knowledge is the only way of civilization. When we let history carry us back two or three thousand years we find that there was a vast amount of knowledge in existence then; science, philosophy, rhetoric, mathematics, but it was confined to a very few. If the knowledge possessed by those very few individuals could have been communicated to all alike, the ancient nations would have been but little inferior to our own today.

It was for this diffusion of knowledge for the benefit of the craft that The Clay-Worker appeared. Our journal was no mere commercial speculation by some publisher looking for any kind of a field in which to make a profit, but the outgrowth of the need and want of clayworkers, who saw in such a publication the most potent means for the advancement of the general good.

In every line of effort, in the arts of war, or peace, names of great men are found, men of leading and light, who make the way easy and successful for their fellows. In the forty volumes of The Clay-Worker are enshrined the names of all our own great men, original thinkers, writers and inventors, the men who have given us new processes, new kilns, new machines, besides the countless details, seemingly small, but nevertheless of immense importance, that individual observation has noted and offered, through these pages, for the benefit of all.

It may be thought that there is little need for the editor of The Clay-Worker to toot his own horn, but in twenty years new generations arise and though it can not be said that "They know not Joseph," yet they know not, or do not think, of all that Joseph has attempted and done these two wondrous decades of the world's life.

THE ILLINOIS CLAYWORKERS' BANQUET.

The annual banquet, served to the members and guests of the Illinois Clayworkers' Association Wednesday evening, under the auspices of the Danville Brickmakers, was a most felicitous affair. The dinner itself was more than ample and well served. During the closing courses champaign flowed freely and the toast proposed by Mr. Randall, "May the Danville Brickmakers Dwell Together in Harmony Forevermore," met with hearty response. After the coffee, cigars were lighted, and then the real feast of the evening began. Dr. A. L. Converse, Springfield, officiated as toastmaster in his own inimitable way and started a two hour session of story telling, for there were no set speeches. The first to be called upon was Mr. S. W. Dixon, who, as representative of the Mayor, bade the visitors a cordial welcome, told of the growing importance of the city as a manufacturing center, paid a tribute to the enterprise and ability of Mr. Butterworth and the other local brickmakers for the important part they are taking in the building of the city. Ex-President Heafer was then asked to tell how it feels to be President. Mr. DeJoannis was next called upon for a song and responded with "Life on the Ocean Wave." Then in turn, Mr. Fawcett Plumb, Mr. M. C. Meigs, of Lafayette, Ind., who recited some original poems. Mr. Whitney, of Terre Haute, Ind., Mr. G. M. McDowell, of Danville, W. S. Purington, of Galesburg, J. W. Robb, Clinton, Ind., T. A. Randall, of Indianapolis, Frank W. Butterworth, Danville, S. C. Cowgill, Summittville, J. G. Shea, Danville, Wm. Hammerschmidt, Lombard, and D. H. Jansen, of Pekin, were targets for Toastmaster Converse's witticisms, and entertained the hundred or more who participated with amusing stories and anecdotes fitting the occasion.

TRADE LITERATURE.

THE ATLAS CAR AND MFG. CO., Cleveland, Ohio, has out a new catalogue, which they will be pleased to send to any of our readers on application. It has one of the most striking covers we have ever seen. It is a very dark rough surfaced paper, on which the title is printed in red and gold. It contains a countless number of illustrations of dump cars of every description, side dump, end dump, bottom dump, in fact every conceivable kind of dump car is shown. Also a line of turntables, brick cars, with and without racks, car trucks, transfer cars, and all manner of portable tracks, switches, railroad crossings, etc. Write them for a copy.

THE WILLIAMS PATENT CRUSHER AND PULVERIZER CO., St. Louis, Mo., has favored us with their new catalogue containing illustrations and descriptions of the Williams Clay Disintegrators and Pulverizers, of which they make an extensive variety, and of any size and capacity desired. It would seem as if there is no material that mortal man would care to pulverize or crush that can not be handled in one or another of Williams' machines. A line of clay screens, elevators, brick trucks, clay feeders and mixers are also shown. A copy can be had for the asking.

THE STANDARD DRY KILN CO., Indianapolis, Ind., has out a new leaflet entitled "Standard Users and Why." It is bound in a cloth-like brown paper, on the title page of which appears a group of masculine faces, each with a "smile that won't come off." The inference is unmistakable. Standard users are satisfied users. This impression is backed up by a large number of very flattering testimonial letters. Those who contemplate dryer improvements are advised to write for a copy.

THE AMERICAN SAND-LIME BRICK CO., 225 Dearborn street, Chicago, Ill., is mailing a new booklet entitled "American System for Making Sand-Lime Brick." The cover is a dainty combination of pale green, red and dark brown. Within is told the story of the sand-lime brick, how they are made, the quality and durability of the brick, cost of manufacture, and kind of materials best adapted for this modern product. They court correspondence from all who are interested.

W. E. CALDWELL & CO., Louisville, Ky., manufacturers of tanks, towers and tubs, for factory purposes, has out a new catalogue giving some pertinent facts about their products, which are constructed both of steel and of wood. The book, which is nicely printed, contains tables giving the sizes and capacity of tanks, which many of our readers might find handy, and much other interesting and instructive data. Those needing tanks for any purposes are requested to write them, mentioning THE CLAY-WORKER.

BECHTEL BROS., Waterloo, Ontario, have sent us a new catalogue telling of their labor saving devices for brickmakers. The cover is of gray paper very prettily decorated in gold and red, the latter feature being introduced as a section of a brick wall. The artist has handled it in an exceptionally skillful way. The labor saving devices consist of Bechtel's patent trucks and carrying system for handling green brick from machine to kiln in bulk. The same apparatus it seems is adapted to the handling of drain tile. They also illustrate a line of tile cutting tables, and a centrifugal disintegrator and stone separator. Our readers are requested to write for a copy.

THE HORTON MFG. CO., Painesville, Ohio, has favored us with a copy of their 1904 catalogue. The cover is of light gray, with the title in two shades of green—a very pleasing contrast. It contains a fine general view of their factory and numerous illustrations of the Hercules soft mud brick machines, which they offer in a variety of sizes and capacities. Also their Standard brick machine for both horse and steam power, clay disintegrators, and a general line of brickyard supplies, including molds, trucks, barrows, etc.

THE 1904 CROP OF CALENDARS.

Never have we received so large and so varied an assortment of calendars as during the past fortnight. They have come in all sizes, shapes, colors and designs. The first to be received was that previously mentioned, bearing the compliments of C. & A. Potts & Co., Indianapolis. The tiniest of all bears the imprint of the Horton Mfg. Co., Painesville, Ohio, and the largest from the Arnold-Creager Co., of New London, Ohio. The latter is fine for factory use. The decorative feature is a large cut of the Grand Automatic Brick Machine executed in colors.

The most unique in design bears the compliments of the C. W. Raymond Co., Dayton, Ohio. In the center of a diagonal gray mat appears the bust of Wagner in bas relief. They write that they have a variety showing the phizes of other notables, each of which was embossed by a Dayton firm on a Raymond Repress.

The Fernholtz Brick Machinery Co., St. Louis, Mo., chose a very happy design, that of a very beautiful brunette, en medallion, mounted on white cardboard; the effect is very rich.

The Anderson Foundry and Machine Co., Anderson, Ind., present a handsome watercolor view of a famous picture entitled "Pioneer Railroading."

J. C. Steele & Sons, Statesville, N. C., have made a radical departure from their designs of former years and present a large hanger picturing a beautiful woman with an armful of posies, surrounded with gold embossing, making a combination that insures preservation.

James W. Hensley, Indianapolis, chose the picture of a cute little miss bedecked with wild daisies, as a decoration for his calendar, which announces that he offers the trade a line of improved brick machinery and clayworking devices.

New York Brick & Paving Co., Syracuse, N. Y., present a reproduction of an oil painting, nicely executed. The calendar pad is 6x8 inches, just the right size for convenient office use.

The Brockway Brick Co., Brockway, N. Y., like THE CLAY-WORKER, has a standard design, which they use each year. Doubtless their patrons feel that they would not like to do without it. We do.

A. M. & W. H. Wiles, Grassy Point, N. Y., has a pretty combination of picture and calendar, bearing their announcement that improved Stock brick machinery is their specialty.

The Scott Mfg. Co., Keokuk, Iowa, has a variety of designs depicting characteristic Southern scenes, such as the watermelon boy and other "rag time" sketches.

The Preston Brick Co., Hornellsville, N. Y., is evidently a firm believer in the aphorism "Any color so it's red." At any rate their calendar is a deep red, the ornamental feature being a reproduction of the famous painting, "After the Hounds."

The National Musical String Co., New Brunswick, N. J., present a series of litho-photographs of the stars of Grand Opera. It is more suitable for library than for office use, but is appropriate for their use, as they are importers and dealers in standard steel music wire, as the reader may see by turning to their ad. on page 145.

The Dunlap Mfg. Co., Bloomington, Ill., with their offering suggests the conundrum, "When is a calendar not a calendar;" answer, "When it is a match safe." In this instance it is both a match safe and a calendar with a background of northern pines, through which stalks a stately deer, all executed in bronze relief.

Last, but among the richest, in general effect, is a halftone reproduction of a bacchanalian picture mounted in a frame of green, on which is a small calendar pad and the address of the Roessler & Hasslacher Co., dealers in clayworkers' chemicals and supplies, 100 Williams street, New York, N. Y.

Written for The Clay-Worker.

I'M BOUND FOR CINCINNATI IN THE MORNING.

I've been around the circuit since the first N. B. M. A. move,
I've drank delight and profit when we met.
The years give added profit and hosts of friends to love,
Tho' now and then they bring us some regret:
I've feasted in the Southland, in the West and in the East,
Where they gathered from the poles, all distance scorning—
But now, old Cincinnati calls the mudlarks to the feast
And I'm bound for Cincinnati in the morning.

What a woeful waste of money and of time and all of that,
Rounding up each year to talk and loaf about.
My father would condemn it and his father would, that's flat,
And I like to live my daddies out and out.
But I notice lately certain things that jar my homely bent,
That I'm getting left behind, I have a warning,
So I'll visit this convention, if it takes my last red cent,
And I'm bound for Cincinnati in the morning.

I used to be a mudlark of the old pod-auger kind,
With my eyes forever fixed upon the mud,
Never lifted from the clay bank in a weary search to find,
The profits that my grandads never could.
I scoffed at these conventions and I scorned convention men,
And I felt myself a Solomon a-scorning,
But when my neighbors distanced me I ceased a-scoffing then,
And I'm bound for Cincinnati in the morning.

Oh, come to Cincinnati, boys, and take a little rest,
For a constant grind is bound to bring a sore.
If you've never met your brothers you will find them of the best,
And you're bound to meet them yearly evermore.
For the ties you form at meeting will be ties which hold you fast,
And you'll find a brighter world for you a-dawning.
But a lobster never changes; he's a lobster to the last,
There'll be none at Cincinnati in the morning.
—B. J. Dunn.

D. V.'S LOST CHORD.

(Being a paraphrase of a tender ballad composed for Boston and lost.)

We'se gwine to Cincinnati
No more we'se gwine to wander,
We'se gwine to Cincinnati,
We can't stay 'way no longer,
For we heard Eudaly calling,
And all Ohio bawling,
Our heart's in Cincinnati,
And we must go.

Chorus.
We'se gwine to Cincinnati
You bet yer bran new hatti,
We'se gwine where we first began to grow.
We hear the people callin'
'Tis time you was a crawlin,
Our heart's in Cincinnati
And we must go.

We've sampled Pennsylvany,
We've toyed at Old Point Comfort,
And loved the Allegheny,
And down to Buffalo.
We've even stopped in Boston,
And drank champagne with frost on,
But no place like our first one,
And we must go.

Chorus.
We'se gwine to Cincinnati
You bet that's where we're at ti,
We've witnessed seventeen good years come and go.
The world has grown more clever,
Our hearts grown warmer ever,
We sigh for Cincinnati,
And we must go.
—B. J. Dunn.

NEW YEAR'S RESOLUTIONS.

No more pipes, no more wine,
No more follies wholly mine,
No more weakness, no more waste,
No more joys of earthy taste.
No more anger, no more greed,
No more self acclaim to heed.
No more rushing on for wealth,
No more squand'ring precious health.
Good bye faults! I leave you here,
Free I face the glad new year.
Good bye faults—but pause awhile,
We have journeyed many a mile.
Comrades, friends you seemed to be,
Friend, good friends, aye, part of me.
Faults, my faults, I've known thee well,
Thou alone of me can tell.
Thou who wast with me so long,
Thou who taught'st me to be strong.
Thou who broke and molded, aye,
Seasoned, fired and hardened me.
This new year—a stranger he—
What brings he in place of thee?
No more pipes and no more wine,
What is left to be called mine?
Friends, come, sooth my troubled brow,
I'll not cast thee from me now.

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WANTED, FOR SALE, ETC.

WANTED.

A situation as superintendent of a front brick plant; have had years of experience and can give good references as to character and ability. Address THOROUGH WORKMAN, Care of Clay-Worker.

FOR SALE AT A BARGAIN.

One small auger tile mill in good running order; too small for my use; will take $75 for it. Address
1 tf dm D. M. CONING, Brookville, Ohio.

FOR SALE.

A 20 h. p. steam soft mud brick yard, rack and pallet system, all in good condition; with plenty of water and handy to the railroad. Call on or address,
1 2 c O. R. HINES, Scio, Ohio.

FOR SALE.

Brick plant at Ashtabula, Ohio, 11 acres of clay, burns a cherry red. No lime or whitewash. Pallet system, modern and up-to-date. Below the clay is an inexhaustible supply of blue shale which makes the finest of pavers, building block, front brick and terra cotta ware. Have samples from Bucyrus, Philadelphia, Chicago and Pittsburg. A valuable piece of property for the right party. Address,
1 3 cm O. W. SIMONDS, Ashtabula, O.

For Sale, Wanted, Etc., Ads Continued on Pages 125, 127 and 138.

Written for The Clay-Worker.

WITH THE KANSAS CITY CLAYWORKERS.

THE SALE OF BRICK is reported to have been remarkably good, for the winter season, to the present time, as there has been so much fine weather throughout the West, in which building operations could proceed the same as in the fall. These good conditions are not expected to continue very much longer, however, as January and February are usually genuine winter months in this section, and March can hardly be classed as a good building month.

Brick manufacturers look forward to this year as being ahead of the past one, even if it is a presidential year. The preparations are being made for a larger business, and, if the contractors know what they are talking about, it is evident there will be little let-up in building operations on account of the presidential election. There was very little dullness four years ago in this part of the country, and it is now thought there will be even less in 1904.

Building permits were issued in Kansas City, Mo., alone, without the suburbs, which amounted to almost $8,000,000, during the past year, showing an increase of over $1,000,000 over 1902. This, in spite of the fact that 4,003 permits were issued in 1902 and only 3,604 in 1903. It appears that a great deal of repair work was done in 1902, while a large amount of new building was done last year. It is said that 70 per cent. of this new building was on homes, which averaged in cost between $1,800 and $5,000. This is certainly a showing which was not expected last June, at the time of the big flood, and contractors say that this year will see a great deal of building which was planned for last year.

The cheapening in the price of building material is stimulating investors, and the architects of this city are very busy at this time with plans for various kinds of work. There has been little labor troubles, and the contractors are in hopes that the laboring men will see that their best policy for making money this year is to keep perfectly still about wage demands, for, if they do, there will be so much building, that skilled workmen will be able to get the very top pay, and will be in great demand at that price. There was a scarcity of labor last year, and a great deal more work is now under contemplation, so it will probably be a case of the laboring man deciding next spring whether he wants to work at good wages, by allowing all work to go on, or strike for unreasonable wages, and thus cause the investors to defer their building plans to some other year, and then have the pleasure of being idle a good deal of their time. It is thought there will be little trouble with them, and that they will use common sense and make their share of the money, while those who have it are ready to spend it for something they have.

The Master Brickmakers have elected the following officers for the enthe ensuing year: J. E. Taylor, president; J. A. Callahan, vice-president; Jacob Belch, treasurer; E. R. Tomlinson, secretary; P. H. Noonan, F. L. Funk, M. C. Downing, J. A. Oats and J. H. Massman, directors.

Nathaniel Dickey, father of W. S. Dickey, of the W. S. Dickey Clay Manufacturing Co., has returned from a visit to Europe, where he spent several months, most of the time near Belfast, Ireland, where he was born. Mr. Dickey is 77 years of age.

Chas. Roll, who has been collector for the Kansas City Hydraulic Pressed Brick Co., for the past fifteen years, has resigned and is said to be contemplating engaging in the brick business in this city on his own account.

A meeting of the leading Republicans of this city was recently held, to look for timber for a mayor, to make the race at the next election. W. S. Dickey seemed to be the choice of almost everyone present, and he was urged to accept the nomination, but stated that for business reasons he would not be able to give the office proper attention, if elected, so he would not allow his name used.

The Pittsburg Brick Co. is now filling a large contract for paving brick with the Parker-Washington Co. These brick are being delivered to Kansas City, Kas., where that company already had the concrete, etc., down, and was ready to lay the brick, before the cold weather set in.

Thomas Eadie, who has been general manager and assistant treasurer of the Kansas City Hydraulic Pressed Brick Co. for the past fourteen years, has at last secured assistance in taking care of the large interests controlled by the Kansas City branch. The first of this year his work was divided up, and he continues as assistant secretary and treasurer, having entire charge of the office end of the work, while F. L. Joy, who has been manager of the Omaha Hydraulic Pressed Brick Co., of Omaha, Neb., has been transferred to this point, and will be general manager, having full charge of all the outside business.

The Pittsburg Brick Co. reports landing the contract for 800,000 vitrified brick, to be used by the contracting firm of Barnett, Record & Co., of Minneapolis, in building a grain elevator in this city. This is another victory for vitrified brick in buildings. The builders, who are putting up buildings to stay, are giving a great deal of attention to the vitrified brick in this part of the country. Its many advantages in both appearance and wear are gradually winning friends for it from all parts of the country. Wet weather does not make it look bad, and finally crumble off, but merely washes off the surface, leaving the house constructed of it much brighter and cleaner looking than it was before the rain. It would appear that vitrified brick would be especially appropriate to use in a climate where there was a great deal of rainfall.

The W. S. Dickey Clay Manufacturing Co. reports having just installed a new Monarch Corliss engine in the Kansas City plant, of 250 horsepower.

The Kansas City Hydraulic Pressed Brick Co. report that they are again making brick at the Diamond yards, near this city. The mines at Diamond station were badly damaged some weeks ago by fire, but after the fire was extinguished a force of men was put at work and the clearing up continued, both day and night, until they are again turning out brick. They hardly expected to begin operating these yards before spring, a month ago.

The Pittsburg Pressed Brick Co. have samples of the vitrified brick turned out at their plant in Sycamore. They are a dark cherry color, and appear to be of good quality, although the company says the Pittsburg brick are a still better grade.

The Chanute, Kas., yards of the Kansas City Hydraulic Pressed Brick Co. has been enlarged. The capacity having been increased from 40,000 brick per day to 65,000 brick per day. In making this change, it was necessary to not only add new machinery, but to change both their boilers and engines to a larger capacity.

K. A. W.

WESTERN NEWS NOTES.

The Frost Concrete Stone Co. has been incorporated in Downs, Iowa, with a capital stock of $5,000.

D. J. Young, a bottle and brick manufacturer of Fort Smith, Ark., is advertising his brick business for sale.

The Union Brick and Gas Co. has been incorporated in Phoenix, Ariz.

Baccur Bros. have sold out their brick manufacturing busiiness in Fowler, Colo.

The Rawlins Pressed Brick Co. has sold out its plant in Rawlins, Wyo.

The Oudin-Bergman Fire Clay and Manufacturing Co.'s pottery plant in Spokane, Wash., which was recently destroyed by fire, causing a loss of $15,000, with insurance of only $2,000, will be rebuilt at Mica, about ten miles southeast of Spokane.

McPherson, Reber & Lamber have begun the manufacture of brick in Aberdeen, Wash.

The J. C. Calhoun Mantel & Tile Co. has sold out its retail branch in St. Joseph, Mo.

The Western Mantel & Tile Co. has been incorporated in St. Joseph, Mo., with a capital stock of $2,000.

Chris. Nelson has succeeded to the tile and brick manufacturing plant of Wellington & Doolittle, in Manson, Iowa.

T. J. Burtch and P. B. Price have been investigating the shale in the neighborhood of Hutchinson, Kas., with a view to putting up a brick manufacturing plant there. The tests made for them by two different plants, of the Hutchinson shale, were said to be very satisfactory.

Written for The Clay-Worker.

POTTERY NOTES.

ALL POTTERIES in this city and vicinity report an extraordinarily good year for the year just ended, and all are thoroughly pleased with the results of same. Nearly all of them have just experienced a large year and many of them their largest since starting. The most of the potteries shut down for a two weeks' loaf for the holidavs and are just beginning to get rightly started after same. Some of the plants will run upon the old plan while others will adopt entirely new ones. The Pottery Association of America held nearly every pottery in this vicinity last year in their selling compact but this year a great many are out of this and will handle their business on their own hook. However, a large number remain in, and the Association will continue to prosper. In the stoneware business the Selling Association which was started not long since, is hustling for trade and their compact on prices is also working very satisfactorily. These two associations mark a new epoch in the sale of the different grades of ware so that all pottery now has a definite selling basis, with the exception of art ware, which is practically impossible owing to the fact that the ware is not uniform, nearly every manufacturer making a distinct line.

The last year has marked a great increase in the production of pottery as well as a great increase in consumption. We have an increase of several new atmosphere plants which are now running to their full capacity and several white ware plants which are also running full.

If the unfair importation of the better grades of pottery can be stopped there is no question as to whether we have too many potteries or not. Statistics show that we manufacture about three-fifths of the ware we consume. Something is wrong somewhere and it is on the importation end of the business. Crockery can be made in this country cheaper than elsewhere, but cannot be sold at the prices foreign ware is sold at and get any where near the prices the product should bring. Of course the foreigners cut the prices but then again they are certainly getting a slice of the tariff which is 40 per cent., certainly high enough if we only get it, but the undervaluation of goods is their strong point and it is certainly being worked to advantage. When this is stopped we shall soon find out whether or not we have too many potteries.

The following notes will give the reader an idea of what is being done at the different potteries throughout the country.

The Knowles, Taylor & Knowles Company of East Liverpool is erecting two new decorating kilns which, when completed, will increase their capacity in this department.

The E. F. O'Connor Sagger Works, which is being erected in East Liverpool, will not be finished until the cold weather lets up and it will probably be spring before they are making saggers.

The C. C. Thompson Pottery Co., East Liverpool, is making extensive repairs to some of their kilns. They are also erecting some additions to their works which will give them additional room.

The American Sewer Pipe Co., of East Liverpool, is installing a new electric lighting plant at their East End plant which will be ready for operation within the next week.

The Electric Porcelain Company of East Liverpool will add more buildings to their plant in this city and will install machinery for the manufacture of high potential insulators, etc. The Company has had an unusual run of business since starting their plant and have been erecting additions and additional kilns ever since. They seem to have an extremely bright future ahead of them.

At the annual meeting of the Patterson Foundry & Machine Co., of East Liverpool, manufacturers of pottery machinery, B. C. Simms was elected president; H. N. Harker, vice president; J. H. Brookes, secretary; Monroe Patterson, treasurer and R. L. Cawood, manager.

At the meeting of The Potters Mining and Milling Co., manufacturers of flint and spar for pottery use, B. C. Simms was elected president; J. N. Taylor, vice-president; J. G. Lee, secretary and Wm. Cartwright, treasurer. The company will start up with greatly increased capacity this year, having several new cylinders in operation which will increase their output 25 tons per day.

The Ohio Silica Company, another flint concern of East Liverpool, now erecting their plant, expect to begin operating within a few days. This concern is located near to the other flint mill and will have quite a large plant when completed. Geo. W. Thomas is president; Benj. Harker, vice president; W. G. Stevenson, secretary and treasurer and manager.

The Sherwood Brothers Co., the stoneware pottery at New Brighton, Pa., is installing some new machinery which will increase the output of their plant.

E. A. Baldozer, of Roseville, Ohio, is erecting a new kiln and making other improvements to his plant previous to starting up. The plant has not been in operation for sometime past.

The Progressive Pottery Co. of Roseville, also is using a new kiln, just completed and consider the erection of another.

The J. B. Owens Pottery Co. of Zanesville, Ohio, is installing some new mechanical equipment in the slip house of their pottery in that city.

S. A. Weller is also running his Marietta Street Pottery.

The Bohemian Pottery Co. of Zanesville, Ohio, is also starting off the new year with increased capacity.

The Globe Stoneware Co. of Crooksville, Ohio, is increasing their capacity. New buildings and kilns are now being erected at their plant there.

The Acme Pottery Co., the new white ware concern at Crooksville, is running full blast.

A deal is on whereby the old Crooksville Pottery, owned by The Star Stoneware Co., of that city, will be sold to the railroad company, who are after the ground. Terms of sale have not yet been agreed upon.

The new pottery at Everett, Washington, will soon be ready to start up, as the buildings are almost completed and the machinery being installed.

S. A. Weller, of Zanesville, Ohio, and The Patterson Foundry & Machine Co., of East Liverpool, Ohio, will have a pottery in operation at the St. Louis exposition this year. Mr. Weller puts up the pottery while the other parties install the working parts of same. The plant will contain several kilns and will be in active use during the entire exposition. Ware will be made and sold at the plant.

The French China Company of Sebring, Ohio, is erecting a large addition to their pottery in that city. The Sebring Pottery Co. is also erecting an addition. An additional kiln is also being erected at the French plant.

The capacity of the American Pottery Supply Co. of Baltimore, Md., will be increased largely within the next few months.

The Wolmensdorf Pottery of Wolmensdorf, Iowa, will increase their capacity within the next few weeks considerably.

A new stoneware pottery will be erected at Mica, Wash., by The Bergman Pottery Co. that will cost in the neighborhood of $10,000.00 and will be complete and up-to-date in every detail. The plant will be started as soon as the weather will permit.

On Tuesday night, December 29, a second attempt was made to blow up the boilers of the Progressive Pottery Company's plant. A fire was discovered under the boilers, which were red hot. They were ruined as a result. A plot is suspected.

The condemnation suit of the Zanesville, Marietta & Parkersburg Railroad Company versus The Star Stoneware Company of Crooksville, occupied the attention of Judge Hynus and a jury for three days. After ten hours deliberation, the jury returned a sealed veridect for $12,200.00. The damage to the land was assessed at $500.00 and the damage to the pottery plant at $11.700. L. A. Tussing represented the plaintiff, and Hon. Mr. T. J. McDermott, of Zanesville, and T. D. Price, of New Lexington, were the counsel for the defendant.

The Freemont Pressed Brick and Manufacturing Company, of Freemont, has been incorporated by H. M. Cook, Albert F. Price, Charles A. Foster, L. S. McGormsly and George Wehring for $50,000.

The Rookwood Pottery Company, of Cincinnati, has increased its capital stock from $60,000 to $120,000.

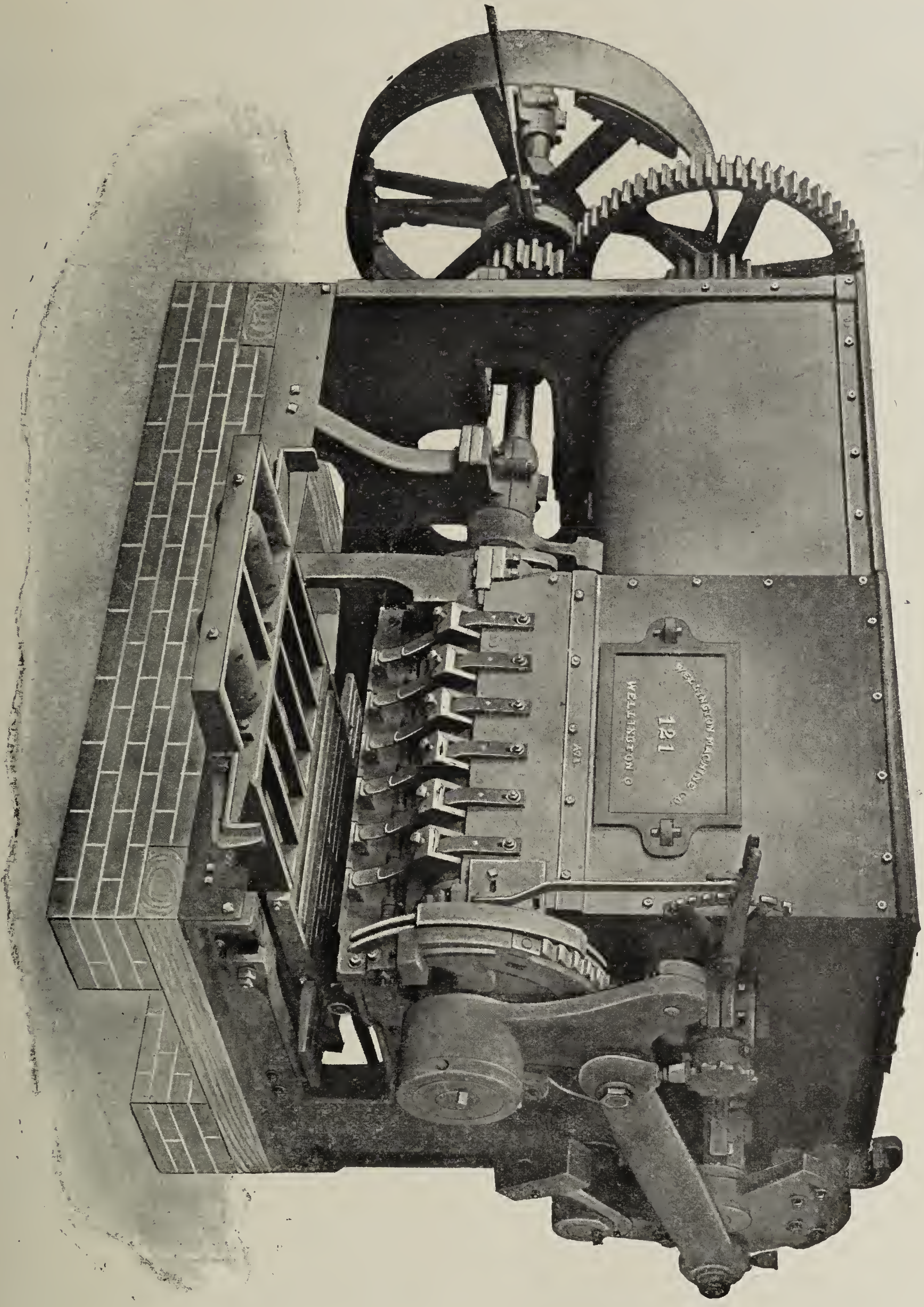
Tom Potter.

East Liverpool, Ohio, Jan. 9, 1904.

OVER
175
"Monarch"
Brick
Machines
in use.

OVER
500
"Quaker"
Machines
in use.

WRITE
to us
regarding
Disintegrators,
Pug Mills,
Mould
Sanders,
Sand Dryers,
Smooth-roll
Crushers,
Moulds,
Barrows,
Trucks,
Winding
Drums,
ump Carts,
Elevators,
ump Tables
and all
kinds of
Kiln
Castings.



The "Big No. 6" "Monarch" Brick Machine.

REMEMBER:
You are losing
money wheeling
brick unless you
have our
ROLLER-BEARING
BARROWS.

The Wellington Machine Co.,
WELLINGTON,
OHIO.

Send for Catalogue.

Written for THE CLAY-WORKER.

PACIFIC COAST NEWS.

THE FACT THAT A Presidential election year is always a quiet one is now taken as an indication by a few of the brick manufacturers that building activity will be comparatively quiet and that the total output of manufactured brick will undoubtedly be less this year than last. Architects and a majority of manufacturers are, however, not so dubious about the building activity and now report that the demand for plans for new structures is a great deal more active than it has been for several weeks past, and moreover, is on the increase. Importation of fire brick are not so extensive as formerly, the reason being that the cost of importation is greater while the price at which they are selling has dropped. Fire brick are shipped in around the Horn and as there is very little wheat, lumber or other freight to be taken back, ship owners are not sending out vessels excepting under high rates. As a consequence the freight rate has nearly doubled in the last six months. Instead of an advance in the price of fire brick it has gone down owing to rivalry among importers and the fact that brick manufactured in California are beginning to have an effect in competition with the imported brick.

The Bush & Mallett Company, manufacturers of mantels, tiles, etc., at 328 Post street, has been forced to vacate on account of alterations in their present building. They will remove January 31st to new and elegant show rooms which they are fitting up in the new Crossley building on the corner of Mission and New Montgomery streets.

The Steiger Terra Cotta & Pottery Works, are starting in the New Year with renewed activity and have already a number of contracts ready to be signed up. One just signed is for the new telephone building on the west side of Hyde street between Bush and Sutter. They will furnish it with grey terra cotta and Roman pressed brick.

The West Coast Construction & Improvement Company has finished the free demonstration street paving with brick, at the corner of Mission and New Montgomery streets, and the results have been gratifying to the members of the firm. The stockholders will hold a meeting on the 9th of January to consider the further demonstration work.

George F. Chevalier, administrator of the estate of Hilaire Remillard, a wealthy brick manufacturer of Oakland, Cal., has sold the 300 shares of the Remillard Brick Company, held by the deceased.

G. W. William, a well known brick man of Clifton, Ariz., has just returned home after an extensive visit throughout the state.

Harbour & Peterson, brick manufacturers of Holton, Cal., have ordered an oil burning outfit to be installed in their plant.

The Clinton-Ellerbeck Clay Manufacturing Company, of Salt Lake City, Utah, among recent orders has shipped a carload of fire-brick to Mercur, Utah, to be used by the Con Mercur Gold Mines Company in the construction of their roasters and other work. The Clinton-Ellerbeck Company, while a new aspirant for public favor, is meeting with success far beyond first expectations.

A movement is on foot in St. Maries, Ida., among business men for the establishment of a brick manufacturing plant in that place. It is claimed that some of the surrounding land abounds in rich clay and only is awaiting development to make it of commercial value.

The Riverside Brick & Lime Company, has been organized in Riverside Cal., for the purpose of engaging in the brick manufacturing business. The company has purchased the old Athletic Park site and a plant will be erected on the property with a capacity of 20,000 brick per day. A fine quality of clay is obtained in this vicinity and the management will be in charge of experienced men. A little later the company will engage in the manufacture of lime. The incorporators of the new company are W. L. Mulford, H. H. Mulford, G. W. Denis and G. C. Denis. This company will furnish the brick for the new Philadelphia block, now in contemplation and several other large contracts are being figured on.

The Baden Brick Company, of South San Francisco, states that it is making a success of the manufacture of hollow terra cotta brick.

The Reno Pressed Brick Company, of Reno, Nev., in the course of a couple of months will be able to turn out 40,000 brick per day. Superintendent Reynolds now has a force of men at work erecting clamp kilns, and the new machinery will be installed in a few days.

The Cudin-Bergman Fire-Clay & Manufacturing Company's pottery plant, located on Sperry avenue, Spokane, Wash., was destroyed by fire recently causing a loss of $15,000, with only $2,000 insurance. The company has leased a plant at Mica, where it will fulfill all orders until the erection of its new plant, which will be located in Mica.

A new brick making establishment has been opened at Aberdeen, Wash., by McPherson, Reber & Lambert.

A large brick smelter is about to be built at Matehuala, Mexico, by the recently organized National Metal Company. A contract has been placed with the C. W. Raymond Company, of Dayton, Ohio, for the construction of a complete brick making plant to be set up at the company's property in Matehuala, and which will be used to manufacture brick for the smelter.

Articles of incorporation have been filed in San Francisco, by the Perfection Chimney Flue Company, with a capital stock of $100,000. The incorporators are Daniel Einstein, Henry Stern, Maurice Willard, Louis Lipman and others.

The E. B. & A. L. Stone Company, brick contractors of Oakland, Cal., have been awarded the contract for constructing the main outfall sewer from Telegraph avenue to San Francisco Bay, by way of 36th street in Oakland. The company has put up two bonds of $75,000 each, one for the protection of the labor and material used in the work and the other to protect the city.

The J. B. Raine Works, manufacturers of drainage tile at Santa Ana, Cal., report business to be rushing with them. The company now has more orders on file for the manufacture of drainage tile than it can fill.

Holt & Gregg, brick contractors and dealers in fire clay, Redding, Cal., have secured the contract for all the brick work for the new factory buildings of the Diamond Match Company, in that place. The first work will be the laying of foundations for five large foundry buildings.

Charles B. Tidball, secretary of the Coast Construction & Improvement Company of San Francisco, appeared before the last meeting of Board of Public Works of Oakland, Cal., for the purpose of demonstrating the merits of a vitrified brick manufactured by the Tesla Company to be used in street paving. He offered, on behalf of the company, to put down a sample block or two, guaranteeing ample time to thoroughly test the work and if not satisfactory there would be no charge to the city. A sample of the material was laid on New Montgomery street, in San Francisco, several months ago and although subjected to some of the heaviest of the city's traffic it has proved satisfactory. If the Board decides to have the streets of Oakland paved with this brick it can be laid for 37 cents per foot, and the company will give a bond guaranteeing the work for fifteen years.

San Francisco, Cali., January 5, 1904. SUNSET.

Ricketsons's Mineral Colors

For Lime, Clay or Cement
Brick or Building Blocks.

The only absolutely strongest and highest grade manufactured. Does not fade.
RED, BROWN, BUFF, PURPLE, BLACK.

RICKETSON MINERAL PAINT WORKS,
Milwaukee, Wis.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED—Second-hand 4-mold dry press in good condition, for cash. Address X
1 1 cm Care Clay-Worker.

WANTED—Practical and experienced man as superintendent of soft mud brick plant, capacity 25,000. Address WM. W. READ,
1 1 cm Princeton, Ind.

WANTED—110 double deck dryer cars to hold 500 brick. State condition, price, etc.
Address H. E. G.,
1 1 dm Care Clay-Worker.

FOR SALE OR TRADE—A complete brickyard; capacity 25,000 per day. For particulars, address, WM. BORREY,
1 tf d Fairmount, Ind.

WANTED—Position by man practical in the handling of enamels and glazes. Only firms intending business treated with. Address
1 1 c COPE, Care Clay-Worker.

FOR SALE CHEAP—A 75 h. p. Westinghouse Standard Engine, in perfect running order, complete. GEORGE SHAFER,
1 1 d Supt. Radford Brick Co., Tip Top, Va.

WANTED — Second-hand sewer pipe press in good order. State price and give description.
Address SALT LAKE,
1 1 d Care Clay-Worker.

FOR SALE—Cheap and on very easy terms, the whole outfit of Crown Dryer system. Has been used very little. Rack and cars the very best.
Address MASS. BRICK CO.,
1 1 cm Montagne, Mass.

WANTED—Good reliable man as burner for continuous kiln. Must have had experience with kilns of this type. Apply, giving particulars of past experience, and name wages, to
JACKSONVILLE BRICK CO.,
1 1 d Jacksonville, Fla.

WANTED—Situation as salesman by party having many years' experience as salesman in clay products. Highest testimonials as to honesty, ability, and character. Address SALESMAN,
1 1 d Care Clay-Worker.

WANTED—Situation as superintendent of brick plant. Have had 10 years' experience; have operated plants making sand mold, stiff mud and dry press brick. Can leave present position on 30 days' notice. Best of references given. Address, H.F.B.,
1 2 dm Care Clay-Worker.

WANTED—Competent manager to operate a well established shale paving brick plant. Would be expected to become financially interested in the company. An excellent opportunity for the right man. Address
1 1 c X. Y. Z., care Clay-Worker.

FIRE CLAY—One hundred acres approximately, 250,000 tons hard clay, thoroughly opened so it can be examined, and results of actual tests by manufacturers and analysis can be submitted. Railroad built to property ready for immediate operation, Clearfield County, Pa. Want buyer for clay or partner to develop. Address CLAY,
1 1 dm P. O. Box 1592, Philadelphia, Pa.

WANTED—A good second-hand stiff mud machine, with side cut-off. Will pay cash for small capacity machine in good condition.
JOHN FACKT,
1 1 dm Mascoutah, Ill.

WANTED—Good burner for fine face brick, buff and white. Liberal encouragement to competent man; rectangular down-draft kilns; bituminous coal. Address MARYLAND,
1 1 C Care Clay-Worker.

FOR SALE.

The Sulphur Springs Brick Yard, at Fort Smith, Ark., the best paying yard in the state. Terms to suit the purchaser. Reasons for selling: Too much other business to attend to.
D. J. YOUNG, Proprietor,
1 2 d Ft. Smith, Ark.

FOR SALE — Brick and tile plant. Fully equipped for brick or tile. Ready market for full output. Will pay to investigate fully,
Address, S. C. LOCK Box 11,
1 1 cm Greentown, Ind

MUST SELL—Small brick plant in central Wisconsin, with new "Hummer" machine. Valued at $2,000. Address
ENDEAVOR ACADEMY,
1 1 cm Endeavor, Wis.

FOR SALE—Two 2-Mold Standard Pattern Boyd Presses, used only for a few months. Good as new. Good reasons for selling.
A. J. HAWS & SONS, Ltd.,
1 1 dm Johnstown, Pa.

WANTED—A good second hand steam shovel one-half to one yard dipper. (Thew Shovel first preference.) One Chamber Bros. Automatic Edger. State condition and lowest price. Address, THEW-CHAMBERS,
1 2 d Care Clay-Worker.

FOR SALE—A good paying brick plant, nicely located; good shipping facilities, both by rail and water. For full particulars address S. P. WOODCOCK,
1 1 cm Salisbury, Maryland.

FOR SALE — One hand-power, side-cut board-delivery cutting table, style F, American Clay-Working Machinery Co. One 4⅜ by 9¾ Miller hand repress. All in good condition. Address
The Columbus Vit. Brick and Tile Co.
1 1 dm Columbus, Kans.

FOR SALE—First-class paving brick plant; business thoroughly established. Orders booked for output to July, 1904. Will guarantee sales for entire output to November 1st, 1904. No one but cash parties need apply. Opportunity for first-class investment. Address
SOUND INVESTMENT,
1 2 d Care Clay-Worker.

WANTED—Situation as superintendent of brick plant. Have had ten years of experince, making building, paving and dry press brick. Good habits and reliable. Best of references. An all the year around plant preferd. Thorough knowledge of down-draft kilns and the operator of all kinds of brick machinery. Further information given cheerfully. Address SHERIDAN,
1 1 cm Care Clay-Worker.

FOR SALE — A large brick manufacturing business, established over 25 years. A prosperous money-making concern, with a yearly capacity of 25 million. About 150 acres. Rail and water shipping. Steam shovel, locomotive, electricity and every facility for economical handling of material. Room for increase. Located in the best section of New Jersey and convenient to Philadelphia and New York market.
Address OLIVER KELLY,
1 2 cm 75 Liberty St., New York City, N. Y.

WANTED—5,000 white pine pallets, 10x32. Must be in first-class condition, and cheap.
DEWRY & IRWIN,
1 2 c Greenville, Ohio.

FOR SALE—One stiff mud brick machine and Fate hand side-cut table. Address
BARTONVILLE BRICK CO.,
1 1 c Peoria, Ill.

FOR SALE CHEAP—Twenty (20) tons 16-lb. relaying rails, also 18-inch wheels with axles.
W. A. UNDERHILL BRICK CO.,
1 1 c No. 7 East 42d St., N. Y. City, N. Y.

POSITION WANTED—By a man who has had a large experience in clay working; a first-class salesman; a knowledge of accounts and correspondence, and with high reference as to character. Address PERCIVAL,
12 1 1 Care Clay-Worker.

WANTED—Position by competent man, as foreman of brick or tile factory. Have had over 20 years' experience and can give the best of references. Address
INDIANA,
1 1 c Care Clay-Worker.

WANTED—By a manufacturing company, a man to take charge of brick mold department. One capable of laying out shape molds, and also handling men. Permanent position to right party.
Address MOLD.
1 1 L Care Clay-Worker.

FOR SALE — Controlling interest in a brick plant close to city of 80,000 population. Good demand for all brick made at $7.00 per M. Cheap fuel, water. Write for full particulars.
Address B. & B.,
1 1 c Care Clay-Worker.

WANTED — Situation as brickworks superintendent by middle-aged experienced man, of good habits. Familiar with all details of manufacture and skilled in managing men and machinery. Employed regularly by one firm for several years. Address JONES,
1 1 d Care Clay-Worker.

WANTED—A good brick setter and burner for updraft kilns which have grates all the way through the kilns, one preferred who is handy, and can repair and build kiln walls; must be sober and steady, and a good workman; steady work the year round. State wages expected. Good healthy location. GEORGE SHAFER.
1 1 d Supt. Radford Brick Co., Tip Top. Va.

WANTED—A thoroughly competent and experienced brickmaker to take charge of a vitrified brick plant in the South. The plant has a capacity of 150,000 brick per day, and employs 150 men. The right man can get a permanent place and good pay, but he must be of good habits, and have a toorough knowledge of the several operations of brick manufacture. Address
HUTCH.
1 1 dm Care Clay-Worker.

FOR SALE.

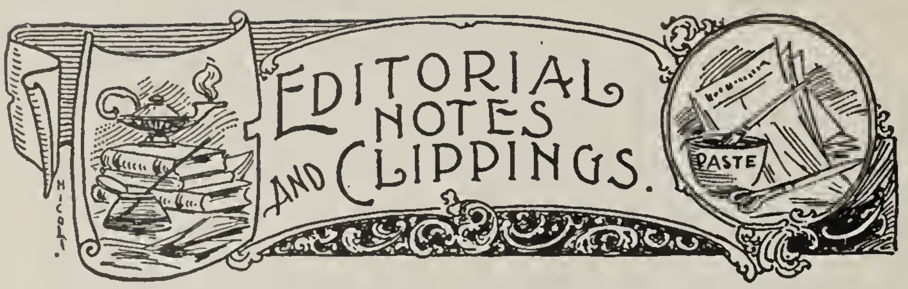
We have a fine line of engine, boilers, steam pumps, belting, pulleys, shafting, soft mud brick machinery, stiff mud machinery, cutting tables, brick dies, pug mills, dryer cars, rail, pallets, heaters and fans for drying brick. Everything we sell is strictly up-to-date, even if it is second-hand. Tell us your wants and we will quote you prices, also send you a complete list of our machinery and supplies. Address
CLARK-SIMS CO., Successors to
1 3 c E. D. Clark & Co. Morenci, Mich.

FOR SALE—AT A BARGAIN.

Two soft mud Martin Brick Machines, daily capacity 30,000 to 36,000 each.
One Pug Mill and attachments for Martin Machine, letter A.
One Crusher and Disintegrator.
One Horton Sander.
One Martin Sander.
8,000 Leg Brick Pallets, 1x10x35.
All in good condition. Address
CHESAPEAKE BRICK CO.,
1 1 p Baltimore, Md.

WANTED—Position as manager or superintendent by a man thoroughly understanding the manufacture of fine front brick, by either the dry clay method or the stiff mud method; also the manufacture of fire brick, fire proofing and common brick. Thoroughly understands the different makes of stiff mud, dry press and soft mud machines, the handling of labor, the handling and building of up and down-draft kilns. First-class references furnished. Would prefer a position in the South. Would like to hear from anyone in want of a first-class man. Address,
1 1 d V. V. C., care Clay-Worker.

For Sale, Wanted, Etc., Ads Continued on Pages 127 and 138.



EDITORIAL NOTES AND CLIPPINGS.

Albert Bauman will start a brickyard at Lidgerwood, N. D.

Simons & Caspary will start a brickyard at Norfolk, Neb., in the spring.

Orlo Thompson has purchased the brickyard of C. B. Bailey at Manton, Mich.

A. D. Kegley has leased some ground at Hayti, Mo., on which he is erecting an up-to-date brickyard.

Chris. Nelson has purchased the brick and tile plant of Wellington & Doolittle at Manson, Iowa.

The Kinston Clark Brick & Tile Co., of Kinston, N. C. has changed their name to the Carolina Brick Co.

Crowel & Co. have purchased the Lotterer brick plant at Cherryvale, Kansas, and are remodeling same.

T. J. Neiswanger, dealer in building material, Washington, Iowa, contemplates going into the brick business.

The Corona (N. Y.) Pottery, owned by Anton Benkert, was destroyed by fire recently, causing a $10,000 loss.

George H. Parks, president of the Olive Hill (Ky.) Fire Brick Co., died at his home at Wheeling, W. Va., January 5th.

Frank Weatherman, a brick contractor of Red Oak, Iowa, is establishing a dry press brick plant, at that place, of 20,000 daily capacity.

George H. Clippert, the well known Detroit brickmaker, is being mentioned as a likely candidate on the Republican ticket for county treasurer.

Michael Dribuick, an employe at the plant of the Ohio Ceramic Engineering Co., Cleveland, Ohio, was badly hurt by being caught in some machinery.

M. C. Madsen, a brick manufacturer of Hutchinson, Minn., contemplates establishing a plant at Glencoe, Wis., for the manufacture of side walk brick.

The brick plant of Wilson Bros. at Spencer, Iowa, has been sold to Straight Bros., who will operate the plant in connection with the one they own at Fonda, Iowa.

Joseph Burns, founder and general manager of the Burns-Hancock Fire Brick Co., Montezuma, Ind., died at his home in that city December 7, 1903, after a brief illness.

The Daglish Mercantile and Manufacturing Company, Tyler, Texas, is in the market for roofing tiles. Will be pleased to receive manufacturers' catalogues and price lists.

Port Arthur, Texas, needs and wants a first-class brick plant. Interested parties are requested to communicate with Thomas Hughes, secretary Chamber of Commerce, Port Arthur.

Edwin C. Harman, Landsdown, Md., writes that he is in the market for second-hand track and cars. Parties having same for sale will please communicate with Mr. Harman direct.

Thorstenberg & Swanson, Lindsborg, Kansas, are in the market for a good second-hand repress of 20,000 daily capacity. Later on they will want to install a dryer, and purchase dryer cars.

J. B. Kneedler, Temple, Okla. Ter., writes that he is in the market for brick machinery and would like to receive catalogues and price lists of both stiff mud and dry press brick machinery.

Freeman & Walker, High Water, Alberta, Canada, advise us that they contemplate starting a brickyard at that place and will be pleased to receive catalogues of brick machinery and supplies.

The J. C. Appleby Sand & Clay Co. has been organized at Jersey City, N. J., with $100,000 capital stock. The parties interested are George Smith, F. C. Smith and James E. Pyle, all of Jersey City.

Andrew C. Moyer, of Tyrone, Pa., of the Mt. Savage Fire Brick Co., died recently from injuries received in a railroad wreck. Mr. Moyer was 45 years old and leaves a widow and three children.

J. C. M. Johnston, New Wilmington, Pa., writes that they have splendid deposits of clay at that place for the manufacture of brick, tile and pottery. There are no factories of this sort there and Mr. Johnston thinks a good man would do well to establish a clayworking plant there.

O'Dell & Tannyhill, brick manufacturers of Lima, Ohio, contemplate the erection of an immense brickmaking plant at Bowling Green, Ohio.

The Marengo, (Wis.) Brick Co. has filed an amendment increasing their capital stock from $6,500 to $20,000. They have had a most successful year.

H. E. Haag and Dorsey Bros., of Hillsboro, Ill., have incorporated under the name of the Beuld Brick Co. and will establish a brick plant at Beuld, a small but hustling town near Hillsboro.

The Lethbridge Brick and Terra Cotta Co., Lethbridge, Alberta, Canada, writes that they desire to purchase a dry press machine and disintegrator. Would prefer second-hand machinery if in good condition.

John Fackt, secretary of the Mascoutah (Ill.) Brick Company, writes that they want to purchase a stiff mud, side cut auger brick machine. A second-hand machine will answer their purpose if it is in good condition.

The Valley Tile & Brick Co. has been incorporated to manufacture brick and tile at Lakeview, De Soto County, Miss. W. R. Wallis, Ben. Boone, J. A. Davis, Richard Abby and others are incorporators. The capital stock is $12,000.

The Southwestern Brick & Tile Co's plant at Lake Charles, La., has reached completion and they are now turning out a fine grade of pressed brick. They now have enough orders on hand to take their product for the next three months.

The stockholders of the Blackburn Face Brick & Tile Co., Leavittsburg, Ohio, held their annual meeting the 6th inst and elected the following directors: Frank Streetor, James Parmly, S. T. Woodman and E. G. Wetherbee, of Painesville, Ohio; J. A. Blackburn and B. L. Craig, of Warren, Ohio.

Col. N. F. Thompson & Sons have had the clay and sand from deposits on large tract of land at Sheffield, Ala., tested with very gratifying results. A stock company has been formed with $100,000 capital and a factory for the manufacture of pottery and clay and sand-lime brick will be erected at once. The main office of company will be at Birmingham with works at Sprucepine, Ala. The company will be incorporated as the Thompson Pottery & Brick Co.

[CONTINUED ON PAGE 128.]

N. B. M. A. CINNCINNATI, Feb. 1st to 13th.

Very Low Rates via

B. & O. S.-W.

THE DIRECT LINE FROM

Pittsburg, Wheeling,
Zanesville, Newark,
Parkersburg, Marietta,
And all Points East.
St. Louis, Louisville,
And all Points West
and Southwest.

Tickets on sale January 28th to February 3d. Good returning to and including February 17th, 1904,

For full information, time cards, etc., consult any ticket agent, or address

O. P. McCARTY, General Passenger Agent,
Cincinnati, Ohio.

EXCURSIONS TO VIRGINIA AND CAROLINAS via

Norfolk & Western Ry.,

On first and third Tuesdays in each month
at Extremely Low Rates.

Pullman and Buffet Sleeping Cars from Cincinnati and Columbus Daily.

W. B. Bevill, General Passenger Agent,
Roanoake, Va.

Allen Hull, Division Passenger Agent,
Cincinnati, Ohio.

KENDALL & FLICK,

Manganese Ores,

Especially for Clay Workers.

Three Qualities in Ten Sizes.

Special Sizes, No Extra Cost.

ALSO IN THE CRUDE IF YOU WANT IT.

The finest, cleanest and most uniform goods produced the world over.

Our Booklet on use, etc., and Price List for the asking.

Mines and Works in
Virginia.

KENDALL & FLICK,
OFFICE, WASHINGTON, D. C.

A 100 PER CENT INVESTMENT!

The Rust Clay Feeder.

It will more than pay for itself in a year, in the saving in labor alone. It automatically feeds the clay into the disintegrator. The feed, being perfectly regular, increases the quality and quantity of the output and reduces the repair account. No up-to-date clayworker can afford to be without this machine. Write for price today.

GEMMER ENGINE AND MFG. CO.,
Marion, Ind.

FOR SALE, WANTED, ETC.

FOR SALE CHEAP — 100 tons 6-inch relaying girder rails, 70 lb. to the yard. 30 feet long. Can be used for buck bars. Address WOLF,
11 3 cm Care Clay-Worker.

WILL SELL, LEASE, or put in a stock company 350 acres land on railroad near here. Fine quality of clay for fire brick, sewer pipe, etc. Large quantities of sand adjacent.
11 5 c IKE A. CHASE, Memphis, Tenn.

WANTED — Competent burner for paving brick yard. Must be familiar with fireclay and shale burning.
P O. Box No. 128,
12 2 d St. Marys, Pa.

CLAY WANTED—We are in the market for a good light buff burning fire clay, free from iron and lime. Could use thirty tons and upwards, daily. Address, VAN,
1 1 d Care Clay-Worker.

WANTED—Position as superintendent of Brick or tile plant. Understand stiff, soft or dry press system. Also can build plant if necessary. Am a good manager of men. Address, A. L. T.,
1 1 c Care Clay-Worker.

FOR SALE—At Brazil, Ind., fine tract of land for location of clay works. Land contains clay, shale and coal in abundance; adjoins Brazil, and is reached by two railroads. Address
R. L. KEITH,
11 3 d Brazil, Ind.

FOR SALE—Valuable slate property, located directly on B. & O. R.R., Ijamsville. Md. Contains slate, shale, iron and clay. Can be utilized for brick, cement, roofing, slate, etc. Address
GEORGE H. RIGGS, M. D.,
11 3 cm Ijamsville, Md.

FOR SALE—Victor Steam Shovel; yard and one-half dipper; forty-five horsepower boiler; shovel has been used but seven months. As we have no use for steam shovel will sell cheap. Address
VICTOR,
10 tf d Care Clay-Worker.

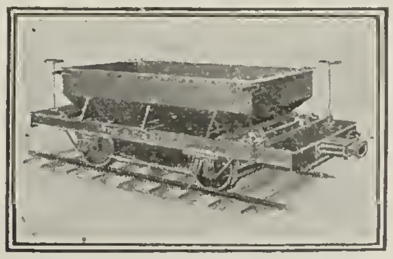
TILE FACTORY OR POTTERY FOR SALE.

Situated on railroad, 30 minutes from New York. Five kilns, brick buildings, water supply and railroad switch. Equipped for majolica pottery, etc. G. BILHUBER,
11 3 dm 220 Broadway, New York City.

FOR SALE.

One 9-foot dry pan, iron frame.
One revolving screen.
One Miller hand press.
One 15-hp. portable engine and boiler.
THE T. B. TOWNSEND BRICK AND CONTRACTING COMPANY,
9 tf d Zanesville, O.

I HAVE CONTROLLING INTEREST in several plants manufacturing clay products and wish to dispose of my interest in some of them. Will give a bargain and easy terms to party with some cash to pay down. Plants all operating with a good business. Address Z,
12 tf d Care The Clay-Worker.



FOR SALE.

Thirty Bottom Dump Cars, all steel, entirely new. Capacity, 5 cubic yards; standard gauge. These cars set very low to track, and can be readily loaded by hand. Suitable for handling stone, ore, shale, marl or other material. An excellent car for contractors' use. Shipment can be made within thirty days. For further information write THE ATLAS CAR & MFG. CO.,
Manufacturers of steel cars and
industrial railway equipment,
11 tf L Cleveland, Ohio.

Continued on Page 138.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

Simon & Son will remove their brick and tile plant from Jamaica, Iowa, to Churdan, Iowa, where they have five acres of fine clay land.

The East Ohio Sewer Pipe Company, of Irondale, Ohio, has increased its capital stock from $75,000 to $150,000. Wm. Banfield is president and F. W. Owesney is secretary of the company.

A. A. Graves, the leading brick manufacturer of Vermont, died December 22nd at his home in Colchester, Vt. He was sixty-five years old and had been prominent in Vermont political circles for many years.

The Fremont Pressed Brick and Manufacturing Co., of Fremont, Ohio, with a capital stock of $50,000, has been incorporated by H. M. Cook, Albert F. Price, Chas. A. Foster, L. S. McGormsly and Geo. Wehring.

The Juniata Brick & Tile Co. is the name of a new organization recently chartered to manufacture brick and tile at Mifflintown, Pa. J. C. Sauserman and W. P. De Lancey, of Newport, Pa., and J. W. Shatta, of Erie, are interested.

M. H. Leatherman, Wadsworth, Ohio, advises us that he is organizing a company to manufacture building brick, hollow building blocks and drain tile, and would like to correspond with men competent to superintend the erection and operation of such a plant.

Albert T. Johnson, a well known fire brick manufacturer of southern Ohio, died at his home in Portsmouth Christmas day. Mr. Johnson was forty-six years old and had been identified with the fire brick business for many years. A widow and three children survive.

The Mexican Sewer Pipe Company, of Cleveland, Ohio, $250,000 capital, has been incorporated by J. E. Morley, E. A. Foote, C. H. Gale, L. H. Tolles and Reuben Hitchcock, to mine coal and clay and manufacture sewer pipe brick, hollow tile and other clay products.

In sending in subscription, F. Roundebush, secretary of the Columbian Fire Brick Co., Covington, Ky., says they are building a plant at that place which they expect to have in operation by March 1st, turning out best quality fire brick and other fire resisting specialties.

E. E. Mc Croskey, treasurer of the Middle Creek Coal Company, Knoxville, Tenn., in renewing his subscription, says: "The Clay-Worker is very valuable and has been of great benefit to me. I am going to begin the erection of a brick plant in connection with this plant at once."

Ira Hilliard, one of the proprietors of the Hilliard & Johnson brick and tile factory at Spencer, Iowa, dropped dead from heart failure December 8. He had been engaged in the brick business all his life. He is survived by a widow and two sons, one of whom, Archibald, will continue the brick business.

John Francy, Sr., a pioneer in the fire brick and sewer pipe industry of Eastern Ohio, died recently at his home in Toronto, Ohio. Mr. Francy was born in Ireland in 1830, and came to this country when 20 years old, locating in West Virginia. He has been connected with many of the fire brick and sewer pipe interests in West Virginia and Ohio, having established the plant now operated by Porter, Minor & Co. In speaking of his death, a local paper says "By Mr. Francy's death Toronto loses one of its most enterprising, progressive and generous and honored citizens. He was an untiring worker in the Presbyterian church, of which he was a faithful member and a liberal supporter. His business life was characterized by the strictest honesty and integrity and he was always known as a generous friend of the poor and needy."

The Pelican Rapids (Minn.) Brick & Tile Co., has been incorporated with $30,000 capital, by Jno. C. Peterson, Wm. F. Paul and K. Stenerson.

The Nashville (Tenn.) Pressed Brick Company has been incorporated by Julius Huegely, J. A. Hobman and H. P. Paul. They have $15,000 capital stock.

The Price Brick Co., Clinton, Iowa, has had a very busy season, and in addition to supplying the local demand they have shipped to outside points.

The Improved Brick & Tile Company has been incorporated to manufacture brick at Sharpsburg, Pa. The incorporators are James Williams, Henry Messer, Edwin Stone and Herman Roth, all of Pittsburg. They have $50,000 capital stock.

The Ohlemacher Brick Co., Michigan City, Ind., recently booked a 2,000,000 order for their sand-lime brick to be used in the construction of the Cable piano factory at LaPorte, Ind. They will begin delivery at once and expect to supply 50,000 brick daily until the order is filled.

The Suburban Brick Co. is practically rebuilding their plant at Bellaire, Ohio, including the buildings which will be of brick and as nearly fire proof as possible. They will install a great deal of new machinery and, when the work is completed, they will have a thoroughly up-to-date plant in every particular.

Henry Maurer, the well known fire brick manufacturer, died at his home in New York City, January 10. He was seventy-three years old and had been in the fire brick business for forty-seven years. He founded the town of Maurer, N. J., where his fire brick and fire proofing plant is located. He leaves a widow, four daughters and three sons.

The Stratton Brick Co., Macon, Ga., report a very busy year for 1903. This company had a very interesting exhibit at the Georgia State Fair that was one of the features of the exposition. The display consisted of a miniature brick plant in full operation and a fine exhibit of their different brick, including pressed, ornamental, building and paving brick. They were awarded first premiums on both displays.

The Williams Patent Crusher & Pulverizer Co., St. Louis, Mo., is sending out announcements to the effect that after Jan. 1st, 1904, the selling of their crushers and grinders will be in charge of Mr. Milton J. Williams as general sales agent with offices at 225 Dearborn street, Chicago, Ill. Mr. Williams has been connected with this company for the past seven years and is familiar with all details, he will be ably assisted and as soon as possible will establish branches throughout the United States and Canada. They will consider it a favor if all parties, desiring information, relative to machinery manufactured by this company, will correspond direct with the Chicago office in future.

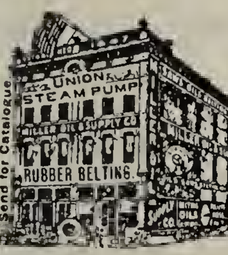
SAWS

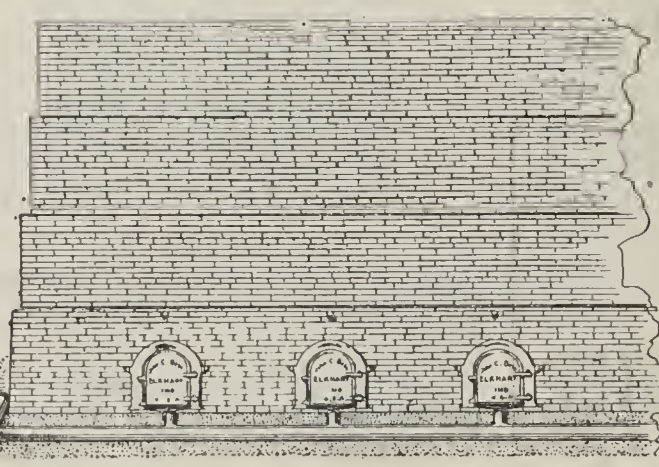
ODD LENGTHS OF RUBBER,
AND GIANT RED STITCHED,

from 2 ft. to 80 ft long, and from 1 in. to 16 in. wide; 3, 4, 5, 6 and 8 ply FIRST-CLASS BELTING less than mfrs. cost prices. GET OUR PRICES on Rawhide, Paolins, Tank Pumps, Hose, Injectors Steam Gauges, Brass Fittings, Lard Oil Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Sawing Machines, One-Man Log Saws Asphalt Felt Roofing, Endless Thresher Belts. One Trial will make you a regular customer of the

MILLER OIL & SUPPLY CO Indianapolis.

Send for Catalogue



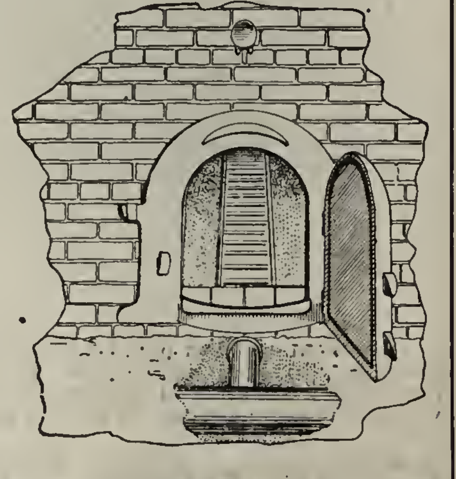


The Boss System of Brick Burning

requires no outside furnaces which are expensive to build and maintain; will burn slack and poor grades of fuel which can not be consumed with success in any other manner.

Send for Descriptive Catalogue.

JOHN C. BOSS, Elkhart, Indiana, U. S. A.



THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

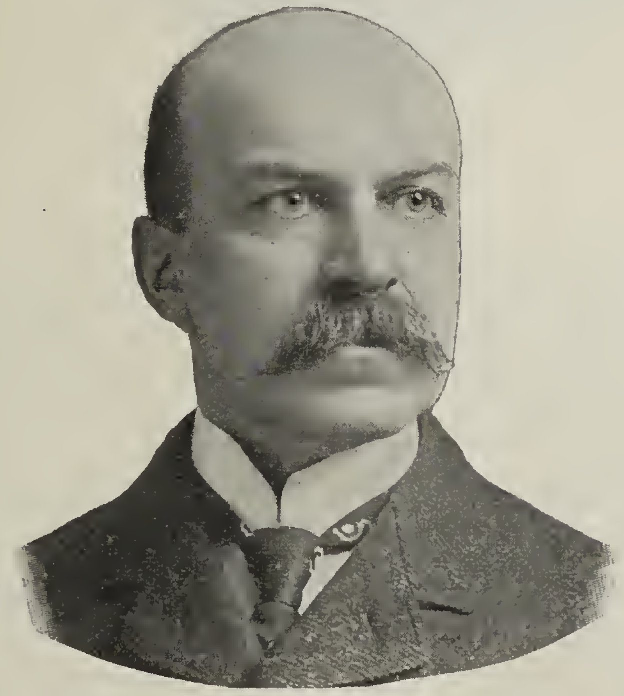
VOL. XLI. INDIANAPOLIS, IND., FEBRUARY, 1904. No. 2.

OFFICIAL REPORT

Of the Eighteenth Annual Convention of the National Brick Manufacturers' Association, Held at Cincinnati, Ohio, February 3, 4 and 5, 1904.

EVERY ONE of the three hundred seats in the cozy Convention Hall of the Grand Hotel was taken when President Eisenhart called the Eighteenth Annual Convention to order, Wednesday, February 3, at 2:30 P. M.

President Eisenhart: We will open our Convention today with prayer as is our usual custom. We have with us the Rev. C. W. Blodgett, of Cincinnati, who will kindly officiate.



PRESIDENT R. G. EISENHART,
Horseheads, N. Y.

The Opening Prayer.

Rev. C. W. Blodgett: We thank thee almighty God, that we live in this scientific age of the world when the body is cared for by the permanency of the structure of the homes where we dwell. For the advancement that is being made for the betterment of life, for the protection of the body from the inclemency of the weather, from all the diseases and disasters that may destroy humanity. We are grateful for our land and our country, and that we are leading today the nations of the world in all of the progress that is worthy of emulation. Thou hast brought hither from the old worlds the best spirits and best minds and molded them together in one composite character. We are sending forth streams of life and light, of frankincense and myrrh from this nation to all peoples of all lands. Here are gathered today men who delve in the earth that thou hast made, who study the chemistry of the properties that go toward the enrichment of themselves. May they never forget that thou didst make and create the molecules of matter, and brought them together from that chaotic state and bid them make worlds, but remember thee as one to whom they shall look for strength and help. In their deliberations, in whatever they say, may there come to them much good in holding communion one with the other. While they are striving for the enrichment of themselves, we believe they are striving for the uplifting of humanity, for the strengthening of the bonds of our nation. May their interests not suffer while they are absent from them, and may the experience of each day here be such that at the close of their session, they may say it has been good to be here. Hear us, we pray, in our offering of praise and thanksgiving, guide us all to the land where there is a permanency in the mansion that is prepared for us by the great architect of character. We ask these favors in the name of the Redeemer of mankind. Amen.

President Eisenhart: The next item is the enrollment of members and roll call. As the enrollment is incomplete we will defer that until a later time. We find on the programme "Welcome to Cincinnati," by his Honor, Mayor Fleischmann. He informs us that much to his regret he cannot be with us, but has delegated instead a Cincinnatian who will speak for him. It affords me pleasure to introduce Mr. C. J. Hunt, who will speak for the Mayor. (Applause.)

Addresses of Welcome.

Mr. C. J. Hunt: Gentlemen and Members of the National Brick Manufacturers' Association—owing to the enforced absence of Mayor Fleischmann from the city, he has asked me to come here and extend to you a hearty welcome to the city of Cincinnati. We hope that your experience here will be such that when you leave, you will grant to us that very high evidence of esteem and appreciation—that of numbering us among your friends. You will find Cincinnati a solid old town. Solid bricks and mortar and granite and iron. You may not see here the signs of rush that you have in Chicago, nor the wealth and splendor that you have in New York, neither will you find here that accompanying selfishness which seems to be a necessary result of the pursuit for wealth and splendor. If you know how to enjoy Cincinnati, you know how to enjoy your friends, for Cincinnati is social, a place for friends to enjoy themselves. This is not the most favorable time to see Cincinnati. Yet you can have enjoyment without being brought in contact with our guardians of peace, except as you may want to use them for sources of information. Cincinnati is best seen when the ground hog has come out again—that is, in the spring. No city perhaps, in the universe, has more beautiful suburbs than Cincinnati, and we hope that having been here when it is cold and bleak, that you will come again in May or June when all our suburbs are at their best, and probably some of you having been brought in contact with the people and having seen the place, may be induced to come here and locate. This is a dirty town, but really all you have to do when you see a Cincinnati man is to take your handkerchief and rub the soot off his face and you find a friend. I know you are here for business, your time is valuable, so all I will say is that the city of Cincinnati extends you a most hearty and sincere welcome. (Loud applause.)

President Eisenhart: I will grant another Cincinnatian, Mr. Eudaly, an opportunity of saying a few words on behalf of the local committee.

Mr. W. A. Eudaly, Cincinnati, Ohio: This is not on the programme, Mr. Chairman and Gentlemen of the Convention. However, I am not taken by surprise, as I was told a few minutes ago it would be put on the programme. Of course, the brickmaking fraternity of Cincinnati and vicinity are very joyous today because of your returning here in your teens. If you had gone until this Association was twenty years old, Cincinnati would probably not have rejoiced so much, but to have you here in your teens makes us very happy. We have no words to express the very great pleasure of the brickmakers of Cincinnati and vicinity over your meeting with us at this time. It was not a question of what to do to make you happy and enjoy yourselves, as how much could we do. I believe if the brickmakers of this vicinity had been given free license by the Mayor a week ago as you have been given today by Mr. Hunt, that they would have carried the town away almost by this time for your enjoyment, but they did not know they would be permitted such liberties as have been indicated. I am no speechmaker, make no pretense along that line. I talk a little sometimes, but we have a gentleman here who can talk, and I have just asked our President if I may not call on him, and he said, "With great pleasure." We have a gentleman with us today who really represents the brickmakers and builders of Cincinnati and vicinity upon whom I am going to call. He is not taken by surprise either, because I asked him awhile ago if he would say a few words and he said he would. I refer to Mr. J. M. Blair, of Cincinnati. (Applause.)

Secretary Theo. A. Randall,
Indianapolis, Ind.

Pres.-Elect W. S. Purington,
Galesburg, Ill.

Treasurer John W. Sibley,
Birmingham, Ala.

Mr. J. M. Blair, Cincinnati, Ohio: Mr. Chairman and Gentlemen of the Convention—Mr. Eudaly is very profuse in his introduction. I want to say a word or two in addition to what Mr. Hunt has said. He has welcomed you on behalf of the Mayor of the city of Cincinnati, and he says he hopes some of you will come here and locate. As a representative of the brickmaking fraternity of Cincinnati, I wish to say we do not want you to come here and locate. (Laughter.) We want to impress upon you the fact that we have all the competition we want. (Laughter.) We know there are some of the brightest brickmakers of the country here. We brickmakers of Cincinnati plod along in the old accustomed way of years ago, and are satisfied with a small profit. We want to sell our output and we do not want any greater competition that we have now. Suffice it to say, that the brickmakers of Cincinnati and vicinity welcome you to Cincinnati. We are plain business men and we entertain in a plain business way. We will take you by the hand, and will be glad to show you anything that is best for Cincinnati, or that will do you good. We feel that Cincinnati has developed into a city of wealth, culture and refinement, of art and music, a metropolis industrial and commercial, a city of beautiful homes and beautiful surroundings. Anything we can do, we will surely do for you. It is our intention while you are attending to your business here in the Convention to entertain the ladies in the best way possible. We shall show them our great Rookwood Pottery, our Art Museum, our hill tops, and take them for a ride through our suburbs, and in the evening give them an entertainment here in this hall. We hope your deliberations here will be the best you have had for eighteen years, and as you have grown in the eighteen years since you first meet here, may the results of this meeting be that much greater. I am pleased to have had this opportunity of bidding you welcome. (Applause.)

President Eisenhart: I shall call upon Vice-President Shellenberger to respond for the Association.

Vice-President George H. Shellenberger, St. Paul, Minn.: Mr. President and Gentlemen of the Convention—It is certainly a great pleasure to the members of the Association to be welcomed to the great city of Cincinnati. It is a well-known fact that most of the great men of this country, especially our Presidents, have been born in the State of Ohio, and a great many of the Western brickmakers to escape being President of the United States, moved West and started in the brick business. That is why you find so many good men in this Association. The Association has met at various places throughout the country, notably recently at Cleveland and then at Boston, and now we are back here in Cincinnati where the Association was born some eighteen years ago, and if Cincinnati enjoys the pleasure of being the parent of many other Associations as strong and as valuable to the interests of the United States as the National Brick Manufacturers' Association has been, she certainly is to be congratulated. Boston set rather a merry pace for entertainment a year ago. The entertainment there was very enjoyable, and I want to say to you that you have quite a task on your hands to keep the pace, but to judge by the remarks of the distinguished citizen who preceded me, I think you will follow it up in good shape. We are glad to be with you, and we know with previous experience in mind that you will enjoy the deliberations of this Association of which I am proud to be a member. (Applause.)

Secretary Randall: The next in order is the President's Annual Address.

PRESIDENT'S ANNUAL ADDRESS.

By R. G. Eisenhart, Horseheads, N. Y.

Ladies and Gentlemen:

It is with pleasure that I welcome you to this 18th Annual Convention of the National Brick Manufacturer's Association. It is very gratifying to me to be honored with the duty of extending to you this welcome, and I congratulate you on your good fortune in being able to meet in this beautiful and magnificent city, its resources being like the hospitality of its people, unlimited and inexhaustible.

First Vice-Pres. J. M. Blair,
Cincinnati, Ohio.

Second Vice-Pres. W. P. Blair,
Terre Haute, Ind.

Third Vice-Pres. A. R. Root,
Princeton, N. J.

Cincinnati is located in the very center of the territory from which the greater part of our membership is drawn, and it was in this city that our organization had its birth, and now, since to Cincinnati is due the honor of having christened our organization, we surely take pride in honoring her by coming back the second time on this our eighteenth anniversary.

What adds to my pleasure above everything else is that we are so fortunate that a number of the founders of this Association are spared, many of whom grace the Convention Hall with their presence. I cannot pass without making mention of the fact that those who became members later on, and others who are yet to be, will always cherish in memory the names of those who so faithfully devoted their time to form this organization. We honor and respect them, and pride ourselves that we may say, the majority of these proved their loyalty, not only by continuing their membership, but never flinched when called to duty, not sparing themselves, their time, nor their ready cash when needed—and while at times subjected to criticism, at no time weary of well doing, but dreadfully disappointed when they found it impossible to go to the annual conventions, there to meet and greet and grasp by the hand their fellow members, whom they learned to love and respect.

It is gratifying indeed to see many of the old "stand-bys" with us today, to feel their warm grasp, and hear their friendly greeting, and also to form many new acquaintances that will ripen into lasting friendship.

But, in the midst of this, mingles a tone in the minor key. The times past bring sadness as well as joy. Not all are with us. Some of the chairs are vacant. Since our Boston meeting, a year ago, Brothers Francis of Shamokin, Pa., Howard of St. Louis, Schultz of Rondout, N. Y., and J. C. Adams of Indianapolis, Ind., have laid down their burden of care and gone to their reward. While we mourn for them we also *revere* their memories.

Meeting as we do in the city of our birth, we naturally look back at the result of that first convention. Those of you who had the pleasure of attending will undoubtedly agree that the first meeting does not now impress you so amazingly as it did then; but after all, the results of that gathering of the faithful few, 18 years ago, in this same identical room, are apparent, and have proven to be of incalculable value, not only for the time being, but for that which is yet to come.

Meeting the first time here at Cincinnati was not only because of central location, but for the added reason that there was an exposition being held at that time. Strange as it may seem, the officials of the exposition evidently considered brick machinery beneath their attention, and refused the desired space. But with men in charge like Endaly, Fletcher, Blair and others, an influence was brought to bear and the necessary space was provided, and a very creditable display of brick making machinery and appliances was exhibited. And thus, by so wisely considering in the early history of our Association the importance of affiliating with the clayworkers, the machine men, the kiln men and all others manufacturing brick yard supplies, was a master stroke, and a step in the right direction, and the continued harmonious working together of these different forces in connection with the help derived from the Ceramic Society, constitutes a power for doing that which will make the clayworking industries one of the leading factors of the economic system of this great country, if not of the world at large.

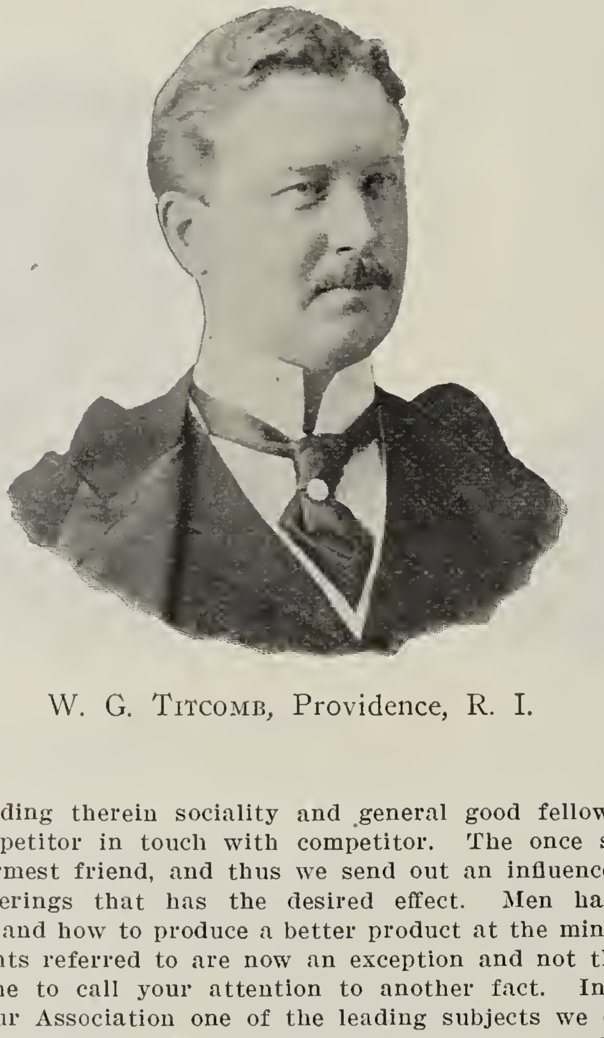
My personal observation of the work covers the period of time since the annual convention held at Indianapolis in January, 1891. I am proud to say that I have attended every one held since (excepting Atlanta, Ga.), and I promise that if I am pardoned for that offense I will never do it again. Well do I remember when at Indianapolis the prediction that our conventions would soon dwindle and the Association would die a natural death. The reason assigned was that men well up in the business would soon tire of incurring expense and devoting time attending meetings for the sole purpose of booming the organization. Please note the failure of this prophecy which is so clearly demonstrated by the fact that each convention held since has been far better attended, and in a general way more of a success than the one previously held.

In making reference to the effective work done by the Association, little needs be said to those who have enjoyed the privileges of membership during the past years. Experience has taught you its value, and therefore what I say along these lines is more specifically intended for the benefit of those who have recently joined our ranks, as well as others who continue to deny themselves of what I term a great privilege. The reading and discussing of the many valuable papers on the floor of the Convention Hall are only a part of the real value of our work. Let us not lose sight of the so-called "side talks" and individual discussions outside of the open sessions, not only during Convention time but thereafter as well. It is from this source that we gather very valuable information not only that we may know what to do, but what is oftentimes of greater importance, find out what NOT to do. I say without fear of contradiction that it is through these channels information is obtainable which not only prevents making business ventures a failure, but in some cases defeat is turned into success.

I take pride in pointing out to you another broad avenue opened up by this Association to its members who deem it necessary to obtain more extended information. We read in our clay journals about what are usually termed "brickyard pilgrimages." These pilgrims travel on the avenue to which I refer. It is frequently the case, if not in their first stop, it will surely follow in the wind up, that they call upon, among others their most zealous competitor. Please notice how they are received. If there are signs up "No Admittance" they are quickly lowered, the doors to the factory are thrown wide open, everything is subject to the closest inspection, all questions quickly and as a rule minutely answered, and when this is done, it does not wind up with an ice cold farewell, but the very opposite, and I have known of instances where the pilgrim was wined and dined, and not until then could he resume his pilgrimage.

We further find that many local associations have been formed because men were brought together in our annual meetings. While competition continues, it is in the main honest and fair, and therefore not harmful. Where strife and bitterness prevailed, we find the warmest kind of friendship, and instead of trying to destroy we try to build up. These are the principles to which we adhere, and because they are in a general way practiced, it is easily explained why our Association is so successful and continues to have a steady and substantial growth.

Some years ago we heard many complaints relative to the ruinous cutting of prices, which it appeared prevailed in many sections. So much was said concerning this matter that at least one, and if I remember correctly, two of our out-going Presidents made mention thereof in their annual address. The importance of this was recognized, but the wisdom of our wise counselors prevailed, and the Association placed itself on record that it was not its mission to take action towards regulating prices or to interfere with honest competition. Instead we directed our forces to follow a campaign of education, including therein sociality and general good fellowship. We brought competitor in touch with competitor. The once stranger is now our warmest friend, and thus we send out an influence from our annual gatherings that has the desired effect. Men have learned better ways, and how to produce a better product at the minimum cost, and complaints referred to are now an exception and not the rule.


W. G. Titcomb, Providence, R. I.

Permit me to call your attention to another fact. In the early history of our Association one of the leading subjects we continually had before us, not only at convention time, but our trade journals treated the subject with care and consideration—it was, "How can we increase the demand for our product and open up new markets for our wares?" Gentlemen, it affords me great pleasure to say the conditions were brought about creating the demand, and new markets are constantly being opened. The then perplexing subject has changed and now is, "How can we best meet the demands of the market?" The same influence that has brought about this splendid condition of affairs will enable us to meet the demands as they will appear from time to time. With our united forces, as already mentioned, we will be able to cope with any and all the perplexing questions that time will bring to us. But understand, we must not grow weary, but we must continue to be active. The clayworker who is today so far advanced that he does not see the need of Association work will wake up some morning and to his surprise he will learn that in the great race he allowed himself to be distanced, and he will certainly be ruled off the track.

The American people have before them many gigantic schemes, some of them so very large that the very thought that they have to be done causes us to pause and ask, can they really be accomplished? We have now before our national congress what is known as the Brownlow bill asking for an apporpriation of $24,000,000 to aid the States in the building of wagon roads. Only a starter! Take this amount and add thereto the appropriations that must be made by the States, and then again what the counties and towns will do, and the figures will be something stupeudous. The work is here, it must be done, and the brickmaker will certainly be called upon to furnish a part of this material. Are you prepared to respond? It remains for this Association to do just exactly what it has always done, by the united efforts of the entire membership—not only the brickmakers, but the professors of our universities, the machine men, the dryer men, the kiln men, in fact all who are identified with us—must continue to be active, and by these united efforts we will bring about a condition that the clayworkers will do their proper portion of this great work that must sooner or later be done.

I recommend the consideration of needed legislation for the betterment of transportation of freight, and car-service rules, and matters of like nature. Most other National Associations have these matters in the hands of proper committees.

Matters pertaining to the exhibit of clayworking machinery and clay products for the St. Louis Exposition are being attended to, and the chairman of the committee, Prof. H. A. Wheeler, will favor you at the proper time with his report.

The present industrial situation is a complex subject. Several years ago it appeared as if though combined capital was arrayed against organized labor. It now seems that matters have assumed a different aspect. In at least some instances it would appear as though organized labor is the aggressor and the manufacturers and the employers are on the defensive. The manufacturers have a strong organization and I am pleased to state that I learn from the proceedings as given in the annual report of the meeting held at New Orleans last April that in the main conservatism prevails. I believe the majority of its members are conservative men. In their resolutions making declaration of principles they do not oppose organized labor, but declare that fair dealing is the fundamental and basic principle on which relations between the employer and the employes should rest. They denounce what they term the "vicious" element in unionism. To what extent this element predominates among labor organizations remains to be seen. It should be the aim of every manufacturer and employer of labor to recognize the rights of the honest toiler, be he a member of a union or not, and when once friendly relationship is established between both sides concerned, we have reason to think that laborers will prove themselves as unselfish and patriotic as those by whom they are employed. Viciousness and repudiation of contract, be it written or verbal, and disregard for law and order should be, and will be condemned by every true American, and the organization or the individual who attempts to over-ride these principles is not worthy of consideration and in the end must fail.

The business community awaits the developments of 1904. Unsatisfactory conditions are sufficient to take away some of the buoyant feeling with which the advent of recent preceding years has been contemplated. Efforts to revise cost of production and readjustments to meet changed demands and supply conditions have made good progress, notable in iron and steel. Producers' ability to take lower prices is, of course, predicted upon the acceptance of decreased wages by employes. Expenditures by prosperous corporations and for other great engineering enterprises, while helpful to make demand for material, may restrict supplies of money for ordinary business. The Presidential campaign may also be unsettling, though not as in previous years, as the currency system is no longer a political football. Free exports of those products manufacturers thought burdensome are to be expected, but as yet no evidence exists of overproduction to any great extent. Up to the middle of 1903 the country had been traveling at a swift pace, but no marked signs of over-extension are visible. Moreover our country is in a far stronger position than it was even five years ago. We owe less abroad than ever before. There are still some cloud shadows, but we hope the barometer will soon begin to rise and the commercial world may expect a fairly satisfactory business along lines of conservatism. It is a noted fact that last year was one of liquidation, that the shrinkage in stock values was enormous, and that there were great disturbances in the cotton, iron and building trades. The country may congratulate itself that the insolvencies were not more serious, but they have been large enough to give warning. Fortunately the crops were fairly good and so were prices, and the country is reasonably secure until this year's harvest shall be due.

Our programme, as you will notice, has a great variety of interesting subjects. Our time for discussions is limited, and therefore it is of great importance that all should make it a point to be here at the appointed time.

I shall in a very short time retire from the Presidency of this Association. Before doing so I desire to say that it has been a very pleasant experience to me to serve the National Association as its presiding officer. I heartily thank you for all your forbearing kindness to me during my administration. The honors you so generously heaped upon me I assure you are highly appreciated, and I hope for my successor the same full measure of co-operation which has been accorded to me.

I wish you all a royal good time during your brief stay here, and happiness when you return to your homes, and a successful and prosperous year. (Applause.)

Secretary Randall: Unless some gentleman wishes to make some comment upon this eloquent address to which we have just listened, we will take up the regular order of the programme. President Eisenhart has given us an address that will bear very careful reading. If any of you wish to comment on it, now is the time.

F. H. Eggers, Cleveland: I think he said it all.

Secretary Randall: The next is the report of our Treasurer, John W. Sibley, Birmingham, Ala.

TREASURER'S REPORT.

To the Officers and Members, National Brick Manufacturers' Association:

Gentlemen—In tendering you my report for year just ended, I feel compelled to plead guilty to the indictment filed against me at the Boston Convention by my friend Copeland of Birmingham.

When I changed my residence to Chattanooga, I thought that under the inspiration of "Point Look Out," I would be all the more faithful watchdog of our "surplus," of which we are so proud; but alas! the Yankees turned my flank and after exhausting all the funds collected by our Hoosier Secretary, the final onslaught was made on the treasury and our reserve lowered $550.00.

Under such circumstances I retreated from Chattanooga, feeling pretty much as my father and his compatriots did, when General Grant and his Yankees made it such an unhealthy location for them, and as the Irishman, who had gone through an attack of the grip, saying it was the worst disease he ever had, as he was sick for four months after he had gotten well.

My better nine-tenths (who has always strenuously endorsed Copeland's opinion) says I will have to make my final stand in the "Magic City" of Birmingham, even if the people there do have to make iron and steel (steal) for a living. It is but just to state that our annual expenses were increased by the commendable appropriation to the World's Fair exhibit, and the publication of the reports of the first and second conventions of the Association and I am pleased to report that we still have a comfortable surplus amounting to $862.79.

Respectfully submitted,

JOHN W. SIBLEY, *Treasurer.*

RECEIPTS AND DISBURSEMENTS

Account of the Seventeenth Annual Convention of the National Brick Manufacturers' Association.

—Receipts—

Balance in treasury, Acct. 1902		$1,389 38
Membership fees—91 at $5—account 1903	$455 00	
Membership fees—417 at $3—account 1903	1,251 00	
Reports sold	8 00	
		1,714 00
Total receipts		$3,103 38

—Disbursements—

Paid for clay exhibits at St. Louis, per voucher	$300 00	
Paid for programmes, mailing, etc., per voucher	67 00	
Paid for number buttons, per voucher	14 30	
Paid for membership lists, per voucher	14 25	
Paid for Convention Hall, per voucher	400 00	
Paid for Exhibit Hall and services, per voucher	71 70	
Paid for 700 Convention Reports, 1903, per voucher	155 75	
Paid for 700 Convention Reports, 1886-7, per voucher	276 62	
Paid for certificates of membership, per voucher	36 30	
Paid for size of brick circular, per voucher	26 55	
Paid for pocket list of members, per voucher	79 62	
Paid for Sec'y, traveling expenses, per voucher	250 00	
Paid for Assistant Secretary, per voucher	100.00	
Paid for scholarship Ohio State University, per voucher	250 00	
Paid for postage, expressage, exch'ge, per voucher	111 00	
Paid for stationery, per voucher	87 50	
Total expenditures		$2,240 59
Balance in treasury, account 1903		862 79
		$3,103 38

—Recapitulation—

Balance account, 1902		$1,389 38
Total expenses	$2,240 59	
Total revenue	1,714 00	
Excess of expenses over revenue		526 59
Balance in treasury		$862.79

(Applause.)

President Eisenhart: You have heard the Treasurer's report. What is your pleasure?

On motion of Mr. C. A. Bloomfield, Metuchen, N. J., the report was accepted and ordered placed on file.

President Eisenhart: The next in order is the election and installation of officers. Nominations for President are now in order.

Election of Officers.

W. D. Gates, Chicago, Ill.: For some fourteen or fifteen years—of course I can't help referring to the time when a few of us boys gathered here for the purpose of inaugurating or setting in motion this Association—of course I know you can hardly think that I was one of the members eighteen years ago and that I came without my mother, but as I said at the start, for some fourteen or fifteen of the years that we have come together it has been customary for Secretary Randall to put Purington on very close to the front of the programme for something, and I have been forced, gentlemen, to make a motion or something of that sort early in the proceedings in order to get before the Convention. (Laughter.)

Secretary Randall: You have always done it well. (Laughter.)

Mr. Gates: I had to get in it right here, for the next item on the programme is a paper by Purington, and he would have had me in a total eclipse. I get up here now, because I have been asked to do something that is very, very pleasant to me. Some time ago I was approached by one of our members and he said, "Who are we going to have for President at Cincinnati?" I never was good at conundrums and I gave it up, and then he named a man to me, and said, "Gates, that man is one of the salt of the earth." That might make him conspicuous in ordinary conventions, but there are so many of us here that answers that description that it is not easy to identify him here. Since that time one and another has spoken to me of that man, and it has been on my mind and been impressed upon me that he is a man particularly fitted for the office of President of this Association at this time. He is a man who is a natural born brickmaker, and knows all the details of the work. He is a man who ships out an amount of brick that computed day by day throughout the year is simply enormous. He is a man who has been diligent in his duty from one convention to another, he has not been as noisy as some of the members, he has been a little less conspicuous than some of us, but for years he has had the good of the Association at heart. This man is a good brickmaker, a model father and husband, he is one of the best friends that God has ever given man as his greatest treasure. Gentlemen, I place in nomination, Mr. Will S. Purington of Galesburg, Ill., for President of this Association. (Applause.)

W. D. GATES, Chicago, Ill.

J. Fred Smith, Omaha, Neb.: I move the nominations be closed and the Secretary be instructed to cast the unanimous ballot of this Convention for W. S. Purington, for President.

Seconded by Mr. Eggers and carried.

President Eisenhart: The Secretary informs me that he has cast the ballot, and I declare Mr. W. S. Purington elected President. (Applause.) Nominations for First Vice-President are now in order.

Mr. Eudaly: I am a little slow at talking, but I have learned to do like Gates does, and I have found it a safe thing to do. I have in mind a gentleman I wish to place in nomination for First Vice-President of this Association. About eighteen years ago, a little more than that, as at that time, we held our Convention in the fall of the year, in this hall, standing almost where I am standing now, this gentleman was the first man to address this organization in any way whatever. He called this meeting to order and the next proposition he made to the gentlemen then assembled, which I am sorry to say has several times today been referred to as a small body—gentlemen, it was, I think the largest body which I had ever seen up to that time—the very next utterance of the gentleman to whom I refer after calling the meeting to order, was one that thrilled me as much as any other thing that ever happened to me, except when I got married. He called the Convention to order and then placed your humble servant in nomination for temporary chairman of that which later became our Association. I was later elected the first President of this Association. I have always had it in mind if ever I had an opportunity to repay him in a public way, I should certainly do so. So I am standing before you today to place in nomination that gentleman. He has held very many honorable positions in this city. He has been president of our Chamber of Commerce, and of our Builders' Exchange, and of our brickmakers' organizations, and many other of our institutions and organizations for the betterment of this city that I do not at this moment call to mind, and in all these years he has stood first and foremost in the ranks of the building trades of the city and in every way all along these years, the citizens of this city have seen fit to honor him in one way or another with some very important positions. At the time of our first Convention, eighteen years ago, he was a member of the Exposition Board, and had it not been for Mr. J. M. Blair, as a member of that board, your humble servant who had to meet that board a number of times, never would have succeeded in getting the very liberal contribution on the part of our Exposition Board in the way of a donation of $1,500 to build an addition to the Exposition that the exhibition of brickmaking machinery might be made. It was through the influence of this gentleman that later when it was found we lacked $600 of having enough to make room for one firm that wanted to exhibit machinery, it was through his influence that the Board of Managers were induced to make a further appropriation of $600. I say these things that you may know I am offering to you no mean citizen for your First Vice-President. As fond of speaking as I am, I did not yield the floor to him a few moments ago without some consideration. I wanted you to see the man I place in nomination, J. M. Blair of Cincinnati. (Applause.)

C. A. Bloomfield, Metuchen, N. J.

Mr. Eggers: It affords me great pleasure to second the nomination of Mr. Blair. I cannot add one word to what Mr. Eudaly has said, he has covered the ground so thoroughly. I move that the nominations be closed and the Secretary be instructed to cast the ballot for Mr. J. M. Blair for First Vice-President of this Association.

Seconded by W. P. Blair, Terre Haute, and carried.

President Eisenhart: The Secretary has been called out, but the Assistant-Secretary has cast the ballot and Mr. Blair is elected your First Vice-President. This brings us to the Second Vice-President.

D. V. Purington, Chicago: Let us have all the Blair family, I nominate W. P. Blair of Terre Haute, for Second Vice-President. I do not need to say anything of his good qualities, because we all know who and what he is.

W. W. Winslow, Indianapolis: Coming from Indiana I take pleasure in seconding the nomination and move we follow the same course as with the other gentlemen.

President Eisenhart: The Assistant-Secretary has cast the ballot for Mr. Blair, and I declare W. P. Blair of Terre Haute, your Second Vice-President. We will now hear nominations for Third Vice-President.

A Member: Any more Blairs here. (Laughter.)

J. H. Chambers, Philadelphia, Pa.: I would like to place in nomination for Third Vice-President Mr. A. R. Root, of Princeton, N. J., a gentleman who is one of three of the charter members who has attended every convention, and nearly every session. He is not a brickmaker, but he is a man who has done a lot of good to many brickmakers, and has always tried to promote the interests of this Association.

On motion the nominations were closed and the Secretary instructed to cast the ballot for Mr. Root for Third Vice-President.

President Eisenhart: Secretary Randall has cast the ballot for Mr. Root and I declare him elected Third Vice-President. Nominations are now in order for the man who is to serve you as Secretary.

Mr. Bloomfield: I have heard said today on this floor, that in this very room, eighteen years ago this organization came to life. At that time it was seen fit to take from the State of Indiana a Hoosier and put him in the chair as Secretary. During these eighteen years he has served this Association well and faithfully. To a great extent the success that has attended this Association has been due to the untiring efforts of this man. At no time in these eighteen years has a member ever called upon him for anything that he could do that he has not gladly done it. And I am happy to say that not only have friendships been formed for him, but we have learned to love him; we cannot help loving him, and we will continue to do so as long as he lives. I esteem it today a great privilege and a great pleasure to renominate for the office of Secretary of this great Association, Theodore A. Randall of Indianapolis. (Applause.)

Lemon Parker, St. Louis, Mo.: I second the nomination.

Mr. Eggers: I second it too and move the nominations be closed, and the President cast the ballot for Mr. Randall for Secretary.

President Eisenhart: The ballot is cast, and I announce Mr. Theodore A. Randall elected Secretary. Nominations are in order for Treasurer.

Mr. Eggers: I nominate Mr. John W. Sibley of Birmingham, Alabama, for Treasurer.

On motion of Mr. W. H. Hunt, Cleveland, nominations were closed and the Secretary was instructed to cast the ballot for Mr. Sibley for Treasurer.

President Eisenhart: The Secretary has cast the ballot, according to your instructions, and I announce Mr. Sibley duly elected.

Secretary Randall: We have another officer to elect by ballot. If you will turn to the back of the programme, you will see we have a Committee on Technical Investigation composed of five members. Prof. Edward Orton is permanent Secretary. The other members are Anthony Ittner, term expires 1907; D. V. Purington, term expires 1906; C. A. Bloomfield, term expires 1905, and W. D. Richardson, term expires 1904. I was surprised that Mr. Richardson, who rarely misses a meeting, had not registered before this. I knew he fully expected to be here Monday. I have a letter just received from Mrs. Richardson stating that he is confined at home by a serious illness, and I want to take this occasion to suggest that we telegraph him our sympathy.

Lemon Parker, St. Louis: I desire to nominate Mr. Richardson to succeed himself as a member of this committee, making his term expire 1908, and move that the nomination be closed and that Mr. Randall cast the ballot of this Convention for him; and also that he wire Mr. Richardson our sympathy and express the hope that he may soon recover his usual good health.

Installation of Officers.

President Eisenhart: I shall appoint Mr. Gates and Eggers to bring Mr. Purington to the platform. It affords me pleasure to introduce to you gentlemen, your new President, W. S. Purington. (Applause.)

President Purington: Mr. President, Ladies and Gentlemen of the Convention.—I want to thank you for the honor. Not until this morning did I know I was even considered as a candidate. I have been with you some fifteen years. This is the fifteenth convention I have attended, and I have attended every session except one, when the railroads delayed me and I did not get in on time. You may find me, however, like the deacon who listened to the first sermon of the new pastor, and after church he told him that he liked his sermon very much, and was glad the minister had come to stay, but he was satisfied that a very much poorer pastor would have answered their purpose just as well if they could have found one. (Laughter.) Mr. Gates has said I was noted for my quietness and I don't propose to spoil my reputation by saying very much. I trust I may be able to perform all the duties you expect of me in an acceptable manner. I will endeavor to do so. (Applause.)

Secretary Randall: I would like to interrupt the proceedings for just a moment in order to present to our new President this gavel, which is sent with the compliments of Mr. C. A. Bloomfield, of New Jersey. It is made from a walnut tree planted by Mr. Bloomfield something over ninety years ago (laughter) in front of his ancestral home. He has carved it from a limb from that now mighty tree and presents it with his compliments. It is but another manifestation of the loyal love and consideration Mr. Bloomfield bears this Association. (Applause.)

President Purington: I desire both personally and on behalf of the Association to thank Mr. Bloomfield for this handsome gavel.

President Eisenhart: I shall ask Mr. D. V. Purington to escort our newly elected First Vice President, Mr. J. M. Blair, to the platform.

Mr. Blair was escorted to the platform by Mr. Purington and introduced by President Eisenhart.

First Vice-President Blair: I have had one introduction today, but I want to thank you sincerely for the honor you have conferred upon me, but I realize it is a compliment to the city of Cincinnati. We feel very proud of our city, and we feel very proud of having you here with us again after eighteen years, and we hope to have you here again. We assure you we are doing everything in the world for the honor and glory of Cincinnati. We love Cincinnati and we love everybody who lives here or is connected with it in business. I thank you on behalf of the citizens of Cincinnati for selecting this humble representative a member of your Executive Committee. I shall endeavor to perform the duties of the office to the best of my ability. Gentlemen, I thank you. (Applause.)

President Eisenhart: I shall ask Mr. Eudaly to escort our Second Vice-President, Mr. W. P. Blair, to the platform.

Second Vice-President W. P. Blair, Terre Haute, Ind.: Mr. President and Gentlemen of the Convention.—I can only say that I thank you most sincerely for electing me to this post of honor, and assure you that in whatever humble way I can further the interests of this Association, I shall at all times be pleased to serve you. My heart is in the work of promoting and encouraging the work of the National Brick Manufacturers' Association. I thank you. (Applause.)

President Eisenhart: Mr. Eggers, will you find Mr. Root back there and bring him up here.

Mr. Root was escorted to the platform by Mr. Eggers.

Mr. A. R. Root, Princeton, N. J.: Mr. President and Gentlemen.—This is most unexpected. They brought me in out of the outer hall and told me there was something for me. While I am now a machine man, I was formerly a brickmaker. I am one of the very few left who have never missed a convention. In my travels about the country I never fail to speak a good word for the Association, and urge brickmakers to attend the conventions. If they only knew the good to be derived from these conventions they would never miss one. It is barely possible, of course, that I may be a brickmaker again myself. Indeed I hope to be. I thank you most sincerely for this honor. (Applause.)

Lemon Parker, St. Louis, Mo.

President Eisenhart: I want to appoint a good strong man to bring Mr. Randall up here. Mr. Haigh, will you assist Mr. Randall.

Mr. Hervey Haigh, Catskill, N. Y.: It affords me great pleasure to perform this duty.

Secretary Randall: Mr. Chairman, Ladies and Gentlemen of the Convention.—Again I have occasion to thank you for this honor. I appreciate it as a distinguished favor. The tendency to reminisce a little here is well nigh irresistible. When I think of the small-large body to which Mr. Eudaly referred that gathered here eighteen years ago and started this organization, and the steady, continual growth that has followed our movements from year to year, I feel that perhaps my work has really been of some value to the Association. At any rate, I have not been a dead weight on the Executive Committee. The Association is stronger today than at any time in its history, we have more members, and I think there is fully as much enthusiasm and as much interest in every department of our Association as at any time in the past. We have with us a sprinkling of young men and not a few of the old ones, some of the faithful are missing, but there are still enough of the old heads to insure counsel and enough of the young ones to insure the growth and, I think, the continued prosperity of our Association. I appreciate all the kindly things you say of me, many of which perhaps are not deserved. I will try to take them at their proper value. I do appreciate your kindness and this re-election, and will try to deserve the confidence you impose in me. (Applause.)

President Eisenhart: Will Prof. Orton kindly escort our Treasurer, Mr. Sibley, to the platform.

Treasurer John W. Sibley, Birmingham, Ala.: Mr. Chairman and Ladies and Gentlemen.—Your kindly appreciation has also been generously manifested to me as to my friend Randall, not quite so many times, but I think this is the eleventh time you have elected me as Treasurer of the Association, and I certainly do appreciate the esteem in which you have evidently held me thus far, and I trust I will be able at the end of the year to show a good surplus. I am reminded of the story of an old Virginia farmer, who at the close of the war and the surrender of General Lee's army at Appomattox, again took up his farming, and offered employment to any of his companions who wanted to earn a livelihood before going back home. A good many took advantage of the opportunity. A friend asked him how he got along with the soldiers and seeing they were divided into groups, asked what the different groups were. The old veteran said, "See that group over there? Well, them's privates. That other group over yonder is lieutenants and captains. These over here is colonels." The friend said, "How do they work?" And the farmer said, "Look here, I am not going to say a word about any man that fit in the Confederate army, but I am not going to hire any generals." (Laughter and applause.)

C. H. YOHE, Alexandria, Va.

President Purington: Gentlemen, this brings us to the regular routine work of the programme.

Mr. Eudaly: Before the ladies leave, I would like to make an announcement. Mr. Blair spoke a few moments ago about the entertainment for the ladies. Tomorrow we will take the ladies for a trolley ride and we would like to have them assemble in the corridor upstairs at fifteen minutes of ten. You are to be ready to start promptly at ten as there is no switch in front of the hotel and the cars will have to move on as quickly as they are loaded. You will be taken care of by the local committee the better part of the day. Tomorrow evening at eight o'clock there will be an entertainment in this room for both ladies and gentlemen. I am quite sure you will all be very much entertained.

Secretary Randall: Before we take up the regular programme there is a matter which I have asked Prof. Orton to present to the Convention.

Prof. Orton: I have a duty to perform at this time which gives me a great deal of internal distress. One year ago today, at Boston, as I sat down in front of the hall and looked up on the rostrum at the speakers assembled there, I noted the face of one who has been in the meetings from year to year ever since I joined this Association ten years ago. From him last year we had one of the most eloquent, one of the most humorous, one of the most wholesome addresses delivered in the entire meeting, and it came from the lips of Jesse Adams. Jesse Adams has been a prominent figure in every meeting that I have attended, and only one short week ago he was laid away. Gentlemen, I ask leave to submit to our Commmittee on Resolutions a memoriam of respect in memory of Jesse Adams.

Mr. C. H. Yohe: I move that Prof. Orton be allowed to prepare this memoriam of respect to Brother Adams, and suggest that we manifest our love for him and grief at his loss by a rising vote.

The motion was seconded by several and carried, the Convention rising as one man.

Secretary Randall: The first regular paper of the session is one entitled, "Our Record of Progress—Eighteen Conventions by One Who Has Attended Them All," by D. V. Purington, of Chicago. (Applause.)

D. V. Purington: At the time the Secretary assigned this subject to me, it did not occur to me but that it would be one of the easiest things I had ever undertaken, to give a review of the organization in the formation of which I had had a part and had loved; I thought it would be a labor of love. Of all the things which I have ever undertaken in my life as I began to get into it, I found it the most difficult. If Mr. Randall had asked me to give a history of the tempering of clay, or any special detail connected with the Association, I would not have had any difficulty, but I come here with the feeling that I should apologize to you, as I do now, not only for the brevity of the paper, but for the shortcomings, and when I heard President Eisenhart read a review of this Association, so able, so eloquent, so comprehensive, I felt still more like apologizing and still more like withdrawing this paper.

OUR RECORD OF PROGRESS—EIGHTEEN CONVENTIONS BY ONE WHO HAS ATTENDED THEM ALL.

By D. V. Purington, Chicago, Ill.

Gentlemen of the Convention:

When the decision had finally been reached to hold this Convention in Cincinnati, the Secretary asked me to give you a history of our Association work since its organization. I doubt if the time has yet come for a history, nor do I believe the historian of any movement should be one who has been a part of its life and growth. It is not the eye witness of events who can give value to the facts, just as it is not he who has shared the heat and turmoil of the battlefield who can give an unbiased account of the campaign as a whole.

Our Association is, comparatively speaking, still very young. Year by year it grows in strength and influence. Let some one of the rising generation write its "history" when the fullness of time has come, but let me jot down a short review of these early years which may furnish the future compiler with some material for that more serious work which shall some day bear the name of "History."

It is easy to fall into a reminiscent mood today, for here it was, that eighteen years ago in this Queen City in this same comfortable hostelry the N. B. M. A. first saw the light of day. The few men whose names are inscribed on the roll of its charter membership were voluntary representatives of the clay working interests in seventeen different States. I use advisedly the word "voluntary" for I believe the organization has always owed much of its vitality to its early rejection of the delegate system of convention memberships. The brickmakers who have attended its meetings have always come because they wanted to, and at their own expense. In the first paper read before the young Association its members were described as a body of earnest, thoughtful workers who were willing to interchange views to help each other, and what was still more rare, to allow others to help them. There seems little reason to modify that description today, for rarely has any organization maintained its fundamental principles so consistently. Mutual helpfulness and good fellowship have been the dominant note at each convention. Spirited debates we have had many, and often, but little of bitterness. Sharply contested issues, but seldom a discourteous word; while many a hatchet sharpened by some old grievance has been buried at these reunions, when competitors have forgotten to be rivals and have become friends. In the main there has been little manifestation of selfishness among our members and aside from the knowledge gained by attendance at conventions, much more valuable have been the results of personal discussions and correspondence between members.

The interest in the stiff mud process undoubtedly reached its climax in 1886. The era of machinery as an auxiliary to the making of brick has been heralded by Kells, Freese, Chambers, Tiffany, the elder Penfield, Brewer, Frey, Martin, Raymond, Whittaker, Boyd and others, and the death knell of the tempering wheel and hand made brick has been sounded. While it was unanimously conceded at our first meeting that the day of the horse as motive power on a brick yard was at an end, there was no such unanimity of opinion that good, serviceable brick could be made by other than the soft mud process. Those of us who have been more or less regular in attendance at these gatherings cannot fail to remember that it was several years after our Cincinnati meeting before a member could venture to sustain a vigorous advocacy of the merits of the dry or semi-dry process of making brick. In all the earlier meetings our members were extremely careful to avoid personalities in discussions, and to say little that could tread on the tender feet of those they knew held diverging views, but many of us can recollect the vigorous language our friend Ittner has used on the floor of the earlier conventions in defending the new process from the old fogies of twenty years ago.

Less than two years before September, 1886, the commissioner of public works in one of our largest cities in an advertisement for sewer brick stipulated that bids would be received only on hand-made brick. When his attention was called to this unjust discrimination he replied that stiff mud brick were too hard and too smooth, that they could not be bonded by cement, etc. The putting together of two pieces of glass with cement amply demonstrated the fallacy of this theory, and it is sufficient to say that all the building and sewer brick used in the aforesaid city for more than fifteen years have been made by the stiff mud process.

Who of the "Old Guard" does not remember the scorn and derision so freely used by our dear old fashioned Philadelphia brethren in their absolute and unqualified condemnation of dry pressed brick? The argument would usually close with the statement: "You may be able to make a decent brick from St. Louis clay, but you can't do it from our Philadelphia clay." What a change in eighteen years! No brickmaker of the present day would have the nerve to say on the floor of this or any other brickmakers' convention that a Philadelphia pressed brick made by hand from well tempered clay, partially dried and repressed in a hand press was mechanically speaking the equal of those made from the same clay properly treated by the semi-dry process. The development of the power repress has kept pace with the life of our Association. C. W. Raymond of Dayton, was, I believe, the first to make a success of the repress, and eighteen years ago stood almost alone as a manufacturer of a machine for the repressing by steam power of a stiff mud brick. With the exception of St. Louis, there was no city of note in the United States that in 1886 was willing to give the dry pressed brick a fair show. This, as has been abundantly proven, was not due to the superiority of St. Louis clay, but to the genius and perseverance of the St. Louis brickmakers.

No branch of the clay working industry has experienced such intelligent growth and wonderful development in the past eighteen years as the dry or semi-dry methods. At the time of our first meeting the manufacturers of St. Louis were the only ones making this class of brick on a large scale. Mr. Anderson, an inventor of Chicago, had produced a machine bearing his name and organized a company in that city, that for some years was an important factor in front brick. It grew, flourished, failed and is now but a miserable memory to those who invested their money in it, but the successful introduction of the higher grades of front brick made by this process in the United States is more due to Mr. Anderson than to any other one man. Prior to his advent upon this field it was extremely rare to see any color but red in a brick building. He experimented with different kinds of clay and with coloring matter and applied for patents covering almost every possible shade of color, and the building world is today largely indebted to his genius for the introduction and adaptation of the several shades and shapes of this class of material. Into such general use have the gray, drab, straw-colored, mottled, speckled and flashed brick come that it is very rare nowadays to find a large office building in any of our leading cities faced with a red brick. I am not claiming that this evolution has always been along the lines of improvement in the appearance of our large cities, but these years have certainly been an era of fads and their development has been productive of improvement in the quality of the material used and great increase in variety of shades and colors.

We no longer hear at our conventions the argument so common eighteen years ago, that it is an impossibility to so press clay as to form a union of the particles composing it, and that only in extreme isolated sections of our country can clay be found that will permit of good, dry pressed brick.

The ignorance which so militated against the introduction of brick made by the semi-dry process was by no means confined to the brickmaker. Architects, contractors and owners united in doubting the usefulness and durability of brick made in this manner. While it is now acknowledged by all, that to successfully work clay by this process it must be prepared by what is usually known as the sweating method, yet eighteen years ago there were comparatively few connected with brickmaking who knew that the necessity existed.

Nothing has done so much to increase the sales of machinery during the past eighteen years as the development of the paving brick industry, and it is fitting in this review of our Association, which has done so much to promote that development, that more than a passing notice should be given this branch of brick making. There were in 1886 few streets in the United States paved with brick and of these there was but little to tempt capital to invest in the manufacture of brick for the special purpose of paving. Pavements had been laid in Wheeling, W. Va., in Bloomington, Ill., and a few spasmodic efforts to introduce them in St. Louis and other places, constituted the extent of the industry. The brick used in these preliminary efforts had been almost entirely made from clay and were simply the best burned hard brick of a grade just above those used for sewer purposes. The fact was well known that throughout the bituminous coal fields were extensive deposits of shale, but so far as is known it was not until 1868 that it was even suspected that this material could be utilized for brickmaking.

It is generally conceded that the discovery of the value of shale for this purpose was made by Joseph Stafford of Galesburg, Ill., who in 1866 crushed some of it in a corn cracker, made it into brick and burned it in a clamp kiln. Following up his idea along through the seventies he sold several car loads to a terra cotta company in Chicago for their use. In 1881 a company was organized for the purpose of making a shale brick by the semi-dry process and in 1883 it was changed into a factory for making paving brick by the stiff mud process.

It might not be amiss to show by figures the marvelous growth of this industry during the comparatively few years of our Association's existence. Up to the taking of the eleventh census in 1890, the industry had not been considered of sufficient importance to secure a position in the statistics of the government. In 1890 there were made nine million three hundred and forty-five thousand (9,345,000) brick for street paving purposes, valued at $982,440. From this point to 1894 there is no statistical record in existence. From 1894 until 1902 the output of paving brick in the United States increased to six hundred and seventeen million one hundred and ninety-two thousand (617,192,000), valued at $5,744,520.00, and the industry became sufficiently important to secure a permanent place in the statistical tables of the Department of the Interior.

D. V. Purington, Chicago, Ill.

This remarkable growth of what is now an important and permanent part of our industry has been almost entirely the result of the work performed by the members of this Association. It is universally conceded, too, that the quality of all burned clay products has greatly improved. This is true of common building and paving brick and more particularly so of terra cotta, glazed, enameled, and all the higher grades of brick. Where the improvement has been so marked and at the same time has progressed so gradually, it is difficult to fix a definite date for its start. It will scarcely be disputed, however, by anyone familiar with the clayworking industry that no decade in the world's history has been more prolific in the development and advancement of ceramic art than the last one of the Nineteenth Century.

During the period we are reviewing, colleges and universities throughout the world have opened their doors to the young men whose aspirations and ambitions have led them to look beyond the present conditions of those engaged in clay working. Legislatures have loosened the purse strings of several States in behalf of an industry which had for so many centuries laid practically dormant.

Machinery has taken the place of hand labor and men who in the earlier times knew only the use of the shovel, wheelbarrow and brick mold, now handle intricate machinery with skill. To be classed as a brickmaker is no longer an opprobrious term. The brickmaker of today welcomes the aid of the scientific investigator and is thankful for his suggestions and assistance. He reads books and periodicals devoted exclusively to the particular kind of work he is doing, and translations from foreign authors on subjects he is directly interested in. He corresponds with the Ortons, Chambers, Richardsons and Eudalys of the Association and gets information gratis which in the old days he could have obtained only by costly experiment. Instead of keeping his books at home, working nights and Sundays, he has a beautiful office finished in hardwood, with steam heat and electric lights. His boys go to college and ceramic schools to fit themselves to fill the honorable place their father has worked hard to prepare for them.

While our Association may not have fulfilled all the hopes and expectations of its founders, it has been fruitful along some unexpected lines. Most notably has it improved the morale of its members and accomplished much that years of individual effort would have failed in doing. It has a membership of gentlemen who take rank with any society of manufacturers in the country. Year by year as an Association we have advanced in intelligent experience and are putting that experience on record in the proceedings of these conventions, and the different trade journals devoted to our craft. No paper reviewing the actual work of our organization would be complete that failed to give credit for its success to one man to whom more than any other such credit is due. He has been one of its officers from its inception and in season and out of season, through sunshine and storm, has worked indefatigably in serving it. To the Secretary who has borne the burden in the heat of the day, who has borne whatever blame was chargeable to any one, and been held responsible for all mistakes, no matter by whom made, the Association is under lasting obligations; he has filled an office that called for arduous labor, for courage, forbearance and tact, and it is only by his judicious exercise of these qualities that our members have been held together. A body of free spirits united in one harmonious whole. Long life to the Association! (Applause.)

H. C. Dunn, Erie, Pa.

Mr. Bloomfield: There is only one thing to my mind that Mr. Purington left out, and that I think is a very important item in the work of this Association that he has failed to attribute to it—the birth at Columbus of the American Ceramic Society that has made for itself a place in the industrial world, and today is making literature that is being sought for by lovers of clayworking all over the world, and I think it ought to go on record as a part of the credit that belongs to the National Brick Manufacturers' Asociation, because the American Ceramic Society is the child of the Association in every sense of the word.

Mr. Purington: Gentlemen, I accept the suggestion.

President Purington: If there is no further discussion, we will take up the next.

Secretary Randall: The next paper on the programme is entitled, "What the Machinery Manufacturer has Done for the Brickmaker," by J. H. Chambers, Philadelphia, Pa. (Applause.)

WHAT MACHINERY MEN HAVE DONE FOR BRICKMAKERS.

By J. H. Chambers, Philadelphia, Pa.

Gentlemen of the Convention:

It will not appear strange to some of you that to one of my calling the consideration of the title suggested by Secretary Randall for this paper could suggest the reverse of his query, and that we could perhaps discuss with less trespass upon your time what have the machinery men *not* done for brickmakers. For with his time honored modesty the typical brick machinery man finds for himself credit in most of the progressive steps in the development of this growing art, while we also must admit that too often there has come a wail from the afflicted scattered upon the plains of kaolin that 'I knew not and ye did me." So that from whatever side one may view Secretary Randall's query will we not find that the machinery man is it?

The history of the mechanic arts associated with any great industry is so closely interwoven with its growth that it seems well nigh impossible to separate the two. Any attempt to enumerate conspicuous steps in the growth of modern brickmaking is but to name one machine, or inventor, after another, or the application of one mechanical principle for another by some enthusiast more venturesome, or more courageous than his neighbor. The brickmaker of today owes much of his comparative ease to the ingenuity of the inventor who delights to deal with one new problem after another, and his co-worker the machine builder who rests not until the device is proven either a success or failure, and its purpose relegated from the things that might be to the thing that is. For, gentlemen, in spite of all failures, in spite of all error, the ignorance of the past, the hide bound prejudice of generation upon generation yields in time through the light of greater intellingence, or through the necessity of commercial competition, to that band of enthusiastic, optimistic mechanics always in advance, and constantly seeking to lighten the burden of drudgery inseparable from the earlier brickmakers' task.

If we would appreciate the extent that some of these inventions influence present day methods, let us in imagiuation dispense with them. Can we see Butterworth with pick and shovel removing his fourteen feet of sand and gravel from over his great deposit of shale, or Purington making half a million brick daily at one location with the aid of hand pick and shovel to dig and load his clay? Does not the one, recognizing that the sand was a water deposit of past ages, call to his assistance the hydraulic engineer and through his intelligent application of natural laws remove by water the unwouted covering; and the other, observing that the railroad engineer uses a steam shovel to make a passage through the face of the earth, argue that the same bundle of mechanics is what he needs to dig holes for the resultant raw material?

You may say that these men are brickmakers, but in a broader sense they are also mechanics who have accomplished their tasks through the aid of machinery men. I know not who invented the tempering wheel and circular ring pit, but his name deserves a crown at your hands as achieving through the combination of simple mechanical means and natural law the result that is not surpassed, and rarely equalled by any of the more complex later day appliances. His process of tempering, if we may so term it, provides not only for the grinding and mixing that we all recognize as necessary, but also takes advantage of time as an element in producing the desired result. There yet remains the inventor who can harness time with its gentle mellowing influence in the reduction of our raw material as a component part of a machine that will also meet the hurry of 20th century brickmaking. When he comes then may we look for the perfect brick and the perfect brick machine.

Present day brickmaking is of necessity mechanical brickmaking, and the successful present day brickmaker is necessarily a machine brickmaker. Hand methods cannot produce all of the various forms of brick and clay shapes used today, nor could the commercial demands of the business be met without the aid of the machinery man and his product.

One of the most successful practical brickmakers we have known is a man who combined with his practical knowledge of the technical part of brickmaking a certain intuitive knowledge of mechanics which enabled him so to modify standard machines and adapt them to the requirements and possibilities of his particular material as ultimately to double, and I may say treble, the ordinary output of that machine. To Mr. Frank Alsip of Chicago, is due the credit of showing an inventor the possibilities of his own invention.

One of the most important tasks of the present day brickmaker is so to know his own material as to insure that the apparatus and methods he may employ conform as nearly as may be to the operation of natural laws. No assumption of fact in this matter is successfully permitted. His neighbor's methods and machines may profitably be changed and modified before they will produce equally good results for him, and in this I think we may often find the reason for such widely different results derived from the same equipment in the hands of different men.

A year ago our attention was riveted upon that new application of machinery in the art of brickmaking, of which Mr. J. Parker Fiske of Boston is sponsor, the underlying principle of which is the handling of brick in large units during the process of manufacture, and while it would be strange indeed if the initial venture in so great a change from old methods should be adopted without some modification, yet there has been laid by Mr. Fiske at his works the foundation of a great advance step in the art of brick making.

That other mechanics recognized the time had come for changes in the method of handling green brick, is seen by the work of those who, while not going so far as Mr. Fiske, yet are prompted by the same idea and working along the same line.

Fiske with his traveling cranes picks up, transports and deposits from machine to dryer, and from dryer to kiln eighteen hundred brick at a time. Scott, of Knoxville, with his mechanism, five hundred as a unit, while Bechtel of Ontario, and Warner of Michigan, from sixty to seventy as a unit. Each of these mechanics saves the brickmaker labor, improves quality, and avoids loss through less frequent handling, and each employs the machinery man's ingenuity to lessen the drudgery of the business and make the brick yarder's job attractive to a more intelligent class of labor. By these things, and through the efforts of a host of such men, does the business grow away from the ignorance and slavery of the past, and step by step reach a higher plane in the production of staple articles.

Mr. J. B. Barney applies his ingenuity to abolishing much of the labor of handling from kiln to car with advantage to the quality of the brick and a reduction of labor.

In eastern Pennsylvania we look with much interest upon the result of a broad guaged installation of mechanics into brick making by the Montello Brick Works under the leadership of Mr. A. A. Gery. This may be said to be the fourth plant built by Mr. Gery, and every one of them represents advanced methods. His dominant idea is not only economy of labor, but economy of fuel and the elimination of waste. Utilize everything. Reduce the cost per unit by manufacturing in sufficiently large quantities to justify the investment in every real labor saving machine, and then so conduct the brick factory that every item figuring as an expense at one end comes out of the other as salable product.

To those of you who have heard the Fifteen Hundred Dollar sawmill man's story, or who travel from end to end of our country and see the primitive brick making conditions of some localities, the large investment of capital in the new Montello Works may perhaps raise a question, but it is being made by men who have done it before; who are doing it deliberately, and who are said to be already reaping satisfactory returns from their earlier investments in the preceding plants.

Notwithstanding adverse criticism, which any departure of this kind naturally invites, it is an admitted fact that if there is a large brick contract within a radius of one hundred and fifty miles, and the Montello Works wants it, they are in position to get it, even against local competition by men who regard themselves as fairly well equipped.

Mr. Gery has sought the assistance of the mechanical engineer and the machinery man in every step he has made, but over all is the direction of the man himself, whose ideas, worked out by long and patient trial, are being put into commercial use.

You may perhaps question whether I adhere to that side of the text assigned me in citing such an enterprise as representing any good that the machinery man is doing the brickmaker. Possibly in its immediate local effect both sides of such a question are open to argument, but whether we desire these things or not, they are before us.

Montello represents a long stride toward economic production, and that is the problem before the 20th century manufacturers in all lines. Can you brickmakers meet it without the aid of the machinery man?

The prominent brickmaker of the near future will not be he who ignores the machinery man, but rather that well balanced strong individuality so well rounded and informed as to turn upon his task the assistance of the chemist, the brickmaking engineer, the mechanical and electrical specialist until the scientific intelligence of the age is his, each according to his capacity or need.

During the thought suggested by Mr. Randall's theme, there has come to my mind the question of how can the machinery men do more to help the brickmaker? If our fraternity attempted to classify brickmakers, I think the division might be somewhat as follows:

First. The practical brickmaker, who thoroughly understands his business and knows in detail his requirements. He can determine from drawings and detailed specifications of any particular machine whether or not it will serve his purpose. He knows fully the result desired in each different process. With this customer the machinery man's responsibility is not heavy. If he also understands his business, let him show his goods, with prices marked, fulfill his representations, and his task is accomplished. The merits of his goods are understood and appreciated. A reasonable margin of profit on a first-class article is not objected to and a mutually satisfactory business relation prevails.

In the second class we might have the practical brickmaker who is perhaps less broadly educated. He is less the man of affairs. He is familiar with, and master of, the purely technical problems of brickmaking as met in his own experience. He, however, has little knowledge of mechanics; can not intelligently criticise a dimension sheet, or specification of any particular machine he may desire to use, and can form little judgment of what will serve his purpose until he has installed and tried it. To this man both machines are iron, and both look alike. If, in buying, he depends upon his own judgment alone, there is often much opportunity for error. If, however, his relation with his machine man is such that he can say, "This is my material. Such is my difficulty. I desire to reach certain results and am hampered by certain limitations. Can you serve me, and, if so, how, and at what cost?" Thus, indeed, is there thrown upon the machinery man a certain responsibility beyond that of mere bargain and sale. The problem submitted becomes his to study. In a certain measure the responsibility for success is upon him, and the injunction to do as he would be done by cannot be ignored.

Third. We have the man, or association of men, who, from various reasons newly embark in the business of brick making, sometimes wisely and sometimes not. Of these I would make two divisions. One the active capable man of affairs, broad guaged, able and successful in their chosen pursuits. They do not pretend to know much of clays or bricks, and comparatively nothing of methods of manufacture. They see a business need, or opportunity, and seek to fill it. They can, however, judge of men, and have well established business principles and methods of procedure, which are applicable alike to all lines of industry. Having satisfied themselves that the basis of a successful enterprise exists, they also satisfy themselves as to the responsibility of the concern with whom they propose to do business, its ability to carry out contracts, the personnel of the men behind the concern, their knowledge and ability in their own business, and being assured in these things, and thus selecting their machinery man, they leave the details to his accomplishment. Here also the responsibility is more than that of mere bargain and sale, but with it is the machinery man's opportunity. Let him plan these works with all the skill at his command, study carefully all the problems involved, avoid needless expenditure, turn his face against a multiplicity of apparatus not required, and treat his client's case as his own.

J. H. Chambers, Philadelphia, Pa.

The other division is that collection of men new to the business, but who have taken stock in sums from five hundred dollars upwards in the brick company, of whose future the local paper has so much to say. Men whose individual affairs require so little of their attention that each has time to plan and manage every detail of this new brick yard. Probably every subscriber to the company's stock has sent to every advertising manufacturer of machinery for catalogues, plans and estimates for "complete plants," generally of a capacity from three to four times the local demand, to manufacture every known clay product, and in response to whose inquiries the machinery men collectively often expend before the order is awarded a sum greater than any possible profit arising from the contract.

Friends, extend your sympathy to the machinery man who gets this contract, as well as to the would-be brickmaker who awards it. The one needs it quite as much as the other. It is needless to say that this class of customer cannot possibly obtain the consideration and the service that is awarded those in any of the preceding classes. With the best of intentions no one can give his best where it will not be received.

Thus, gentlemen, I can find no clearly defined line in the development of this business between the machinery man and the brickmaker. The growth of one has been the growth of the other. The well being of the one is reflected in that of the other, and while the initiative step in improved mechanical methods may have been taken by the machinery men, its successful development has required the sympathy and co-operation of the brickmaker. Without that the invention remains untried and unperfected. On the other hand the brickmaker alone can move but slowly in the march of improvement. To him is offered the machine for acceptance, or rejection, though it may tell but little of a lifetime of labor and struggle involved in its production. Of the many inventions conceived amid equally rosy anticipations few indeed reach the brickmaker, or sail into the haven of profitable commercial use.

In conclusion I would enter a plea for even a closer bond between the two, that the suggestion of one may have, to the fullest extent, the friendly criticism and assistance of the other. For as this has been the greatest means of past growth so it must continue the basis for future betterment. (Applause.)

President Purington: There is no question but that the machine men have done a great deal for us. The Secretary will announce the next.

Secretary Randall: Before we discuss this paper, I would suggest that we listen to the next paper. You have all heard of the simile of the play of Hamlet with Hamlet left out, and this paper of Dr. Converse without Dr. Converse is much like it. If he were here in person to lend his genial countenance and personal magnetism to his paper, it would perhaps hold an entirely different meaning to you who listen. He has viewed the subject from a humorous point of view.

A. L. Converse, Springfield, Ill.

WHAT BRICKMAKERS HAVE DONE FOR THE MACHINE MEN.

By A. L. Converse, Springfield, Ill.

Gentlemen of the Convention:

The question as old as time has been, "Which is the mother of the chicken, the hen that lays the egg, or the one that does the hatching?" Of course in these latter days the question is, "Which is the mother, the hen that lays the egg or the wooden incubator that hatches the chick?"

The story which has recently been told of the work of the incubator, in which the result of one hatching was 27 chicks with wooden legs, and two others which turned out to be woodpeckers, may not be true, nevertheless in this day of wonders we are almost ready to accept any kind of a statement, especially if it is connected in any way with the ingenuity of man.

A few years ago in Kansas a number of traveling men were snowbound and obliged to remain over Sunday in a certain hotel, and as usually happens the majority of these travelers were runners. Immediately after dinner, while engaged in interchanging stories, such as Annanias used to tell, a farmer put in his appearance and asked if there was a clergyman amongst their number.

He was informed that there was no clergyman, but that they had amongst their number a gentleman, fluent of tongue, a good man and one that they felt sure would be glad to serve him in any way that he could.

The farmer informed them that he had been so unfortunate as to lose by death his eldest son, and that he was desirous of securing some one to officiate at the funeral, and that if their friend would render the service he would be glad to take him and such others of their number as would care to go, on his bob-sled which was now standing at the door.

The result was their eloquent companion and a half dozen others accompanied the farmer to the house of mourning.

The runner who was to do the preaching was engaged in selling the "Blow Easy Windmill" and never missed an opportunity to advertise that particular kind of windmill. He started in his discourse with the frailties of human life and the importance of ever being ready when the summons comes, etc. Before closing he stated that this young man had come to an untimely death from the effects of pneumonia, contracted while drawing water from a well with which to water his father's cattle. He stated that if his father had only been provided with the "Blow Easy Windmill" his cattle would have been properly supplied with water, and the young man would doubtless be enjoying his usual health. Winding up with the statement, "Now, gentlemen, you will pardon me, if I state that I am the agent of the famous 'Blow Easy Windmill,' and will be glad to explain its working merits to such as contemplate purchasing a windmill, and thereby forestalling a case of pneumonia which may result in death, as happened to the deceased now lying before us."

The peroration on the windmill nearly broke the old farmer's heart, as he gave vent to his pent up feelings in the following language: "Hold up there you consarned old skinflint, we have your Blow Easy Windmill and that what's the matter with my poor Jim.

"He caught cold while trying to keep that blamed windmill in gear, and when he had it in gear he had to tote water to keep the pump primed, and that's what killed him, you fellers can just walk back to town consarn ye. Don't want any more help in this here funeral; if you come round here again I'll set the dogs on yer."

This story may be somewhat of an exaggeration, but doubtless every individual present has had a somewhat similar experience (barring the funeral). I am not disposed to underestimate the value of good machinery, but the machinery that has been palmed off on the unsuspecting brick man, while the genius was striving hard to make something that would be a success, is beyond computation. I will venture that there is not a man in this presence whose beard is even slightly tinted with grey, who has not had his piety tested to the extreme by some bit of mechanism that ought to work, that was guaranteed to work, that was bought for the purpose of having it work, and still it won't do what it was designed for, never did and never will. Of all in the individuals engaged in manufacturing, I know of none that has been the target for more experiments than the brick man.

I am well aware that on account of the lapse of time since the Children of Israel were obliged to make brick without straw (this part of my argument is likely to be barred out), yet who has ever stated in either sacred or profane history, that the brick made by those Israelites while in bondage were not good brick? In fact were they not so good that the Egyptians were willing to have them made less valuable, by the omission of straw.

Now you may search all kinds of history and you can not find a single word about Chambers, or Freeze, or Martin, or the Bonnots, or Boyds or Simpson, or any of the hosts that are now making machinery having made a single bit of machinery for those Israelites, and yet they made good brick. I have seen plenty of good brick that were made over two thousand years ago; they have stood the test of time and have not got a machine brand on them, nor a mark that would indicate that a machine had been near them, not even a union brand, and still they were just as good brick as are made today, and those brick were all made by hand.

Now all this proves that we could get along without the machine man if we wanted to. But we have not tried to get along without him, we have encouraged him every way within our power, we have told him what we wanted him to accomplish, and how we wanted to do it, we have paid him our money, given him our time, and tried to work his machinery, and when it failed we have taken hold and helped him to solve the mystery, as evidence of which note the missing thumbs and fingers, the cross eyes, twisted backs and flattened pocketbooks.

I am willing to admit that there is some excellent machinery now, that it is doing good work, and that good brick are being made without straw, and a few brick manufacturers are keeping the wolf from the door by using this same machinery; but while I admit all of this, I insist that this same machinery that we all admit is good, is the result of evolution, that while Darwin made no reference to it, yet has been evolving a long time, and the brick men have helped it to evolve, and while the evolving process has been going on many a noble brickmaker has gone down to an untimely grave.

The brick men and the machine men are getting along fairly well now, both are doing good work and helping each other, but that does not alter the fact that the brick men were the pioneers in the work, and that they have been the means of not only putting the machine men on their feet, but have boosted them into the bankers row.

I would not say an unkind word about the machine men, they are good in their place, and sometimes they are good in our place.

We all appreciate a good cigar, a lead pencil, a tape-line, and sometimes a good dinner at their expense; of course we pay well for them in the long run, but don't quite see where it comes in, and where ignorance is bliss it's folly to be wise. All of these things with a goodly portion of wholesome advice seem like gratuities, and perhaps they are, we often take them as such and give our notes due in ninety days for some of their commodities, after which time begins to fly. If any of this audience are troubled with a superfluity of time, let him give a ninety-day note and if time don't hump itself to get there in two weeks, their experience will not be like mine.

But these last remarks were a digression, I ought to have stuck to my text closer, and told what benefactors we are to the foundry men, who are so close of kin to the machine men that they must not be left out of this discussion.

It has always bothered me greatly to see what a few weeks will do in augmenting the size of a scrap pile, and the wonder is where did the material come from, and the kind of material too, we bought nothing but the best machinery made of the finest quality of iron, and now that we want to sell it so as to forget where our would-be profits have gone, we are informed that that pile of scrap is the worst kind of pot metal, and only fit to make into grate bars. We paid on an average of 10 cents per pound for it, and are now glad to sell it for less than ½ cent per pound.

Talk about union combinations, why they are not a circumstance compared with the machine men and foundry fellows' combination. These fellows have the most complete endless chain combination in existence, and it sometimes looks as if we had ignorantly become a party to it.

I am of a social turn and like to have visitors at our plant, but have almost reached the point of putting up signs "No visitors allowed," for the reason that every time a visitor stubs his toe on a piece of discarded machinery, he wants to know all about it, and this is almost as embarrassing as being caught with stolen goods.

I was not itching for this controversy, but when the subject was assigned to me, and I was informed that one of the best machinery manufacturers was going to inform us what the machine man had done for we brick manufacturers, I thought in his dissertation he might possibly leave out some of the things that we brick men can never forget. These subjects are like the great and ever running river, the Ohio, a great deal can be said on either side.

I am under the impression that the hen that lays the egg is the mother, no matter who made the incubator. (Applause.)

General Discussion.

President Purington: You have heard both sides of the question. Now, if there is some one here who can agree with either or both of the gentlemen, we would like to hear from him. Mr. Gates, haven't you something to say on this subject?

Mr. W. D. Gates: I do not think it is necessary to say much on this subject. Both sides have been well presented. It occurs to me that there is one thing that we buyers of clay machinery have not taken into consideration. If we are making good brick we have got to have a good salesman to sell our ware, and if a man is making a bad brick he has got to have a good, hustling salesman to sell them, and the machinery men all have to have salesmen. Every man wishes to excel in his particular line. If he has a good machine, he is bound to try to sell it, and if he has a poor machine he has got to hump himself to sell it. And if he does sell it, he feels he is more a man. There is no question in my mind but that we, the manufacturers of machinery and manufacturers of brick, must go hand in hand. There is no question in my mind but that the growth of this Association is due to both classes. The man who is in the machine shop to draft and make the machinery at first may make a machine that will work one clay better than others. He believes he has the best machine and so he sends out the machine and starts it in a clay that it is utterly unfit to work, and you know what follows. The development of the machine is a slow process, so it makes it necessary for the machine man to thoroughly familiarize himself with the different clays which makes it necessary for him to travel, and if his customer gets stuck, *he* has to travel (laughter), but it makes it necessary for him to travel all over the United States and familiarize himself with the clays and run up against the men who are using his machinery and find out why it does not work and what will make it work. Now the clay man who is using this machine unquestionably assists the machine man, as Mr. Chambers gave him credit and it is only by the two working in absolute unison that anything is accomplished. There is brought to my mind another thing that measures the growth of this Association. You younger members will have to bear with us old fellows in our reminisences, but the one thing more than anything else that has been acomplished by this Association is the establishment and growth of these clayworking schools. They would probably —possibly—have been started in time, but I doubt if they ever would have been but for this Asociation. You have put your boys in these schools and I have put my boys in these schools, and we have seen the progress they have made. I would not have the boys of mine know that I said this for a great deal, but when they come back from that school and from associating with Prof. Orton, remember I say this confidentially, they know more than the old man and they can give him pointers. I hope no one will tell my boys this, for they will get so they can't wear their hats, and will have to have new ones; but I have taken a great deal of pride in seeing what these fellows can scheme out. These young men trained in the engineering course can go into the shop and turn out tables and cabinets, do blacksmith work, do the work of all the different trades; these young men can go into the shop and earn their living anywhere. You put such a young man as that in charge of a brick plant, a man who can analyze clay, who can communicate with the machinery men and can draw up his plans and make plain what he wants and get just what he wants. This has lifted our business up until it is a profession, until it is something we can be proud of. If these trained men want something in the machinery line that they cannot get, they can go to the anvil and make it. He can make his drawings and work with the machinist in a knowing way. There is nothing but what can be accomplished in this country in our line today, and I look forward to the advancement being much more rapid in the future than it has been in the past and I look forward to seeing the clay man and the machine man still brothers and friends as we have been for eighteen years, and getting closer and closer together, working even more in unison in the eighteen years to come than we have in the past. (Applause.)

A. C. OCHS, Springfield, Minn.

Mr. Anthony Ittner, St. Louis, Mo.: I would like to hear from our brother D. V. Purington.

Mr. Purington: I am on both sides of this question. I want to say that I had intended in this Convention to keep still. I did not even get up to nominate my friend Blair until there had been a full pause of half a minute. I wanted some one to nominate him, and when no one else took it up, I did it myself. It was very hard work to keep still. I am glad, however, to be able to pay a little compliment to the experience, or brains and ability, that lead up to that paper read to us this afternoon by Mr. Chambers, and I think when you come to read it over you will find it one of the most carefully written and one of the most meaty papers that has ever been read before this Convention. I cannot say as much for Dr. Converse's paper, although it is a jewel of its kind. It is a different sort of a paper entirely.

Mr. Chambers is right. The brickmakers of this country are under lasting obligations to the machinery man, and while incidentally, the machinery men have got a lot of money out of the poor brick man, but in the main the brickmaker has got the most benefit. Oftentimes the trouble is, as Mr. Chambers said in his paper, the man who wants machinery does not know what he wants. The man who has machinery wants to sell it and he persuades the man who wants to buy to think that what he has is right, and as Mr. Chambers has said most of the trouble has been due to the ignorance of the man who wanted to buy machinery, not knowing what he wanted. I am probably as notable an example of this as there is in this room. I have probably bought as much machinery that I did not want as any one here, and have probably had as large a scrap pile as any one here, but I have stuck to it and have met those ninety day notes, and paid them, too, thank God, and I am done buying experimental machinery. But we must not forget the growth of this country, the machinery man is as necessary to the brick manufacutrer as the brick manufacturer is to this country, and we want to shake hands and go forward hand in hand with the machinery man. (Applause.)

Anthony Ittner: I had hoped that Brother Purington would make mention of a special experience he had in the purchase of machinery, and that is why I called on him, but as he has not done so, I believe I would be justified in occupying the time of the Convention a few moments. So far as the scrap pile is concerned, I think the Ittner Brothers, and Anthony Ittner particularly, carry the palm. One reason is we commenced earlier than others. We worked the first machine that ever attempted to make dry clay brick, outside of what is known as the hydraulic press brick machine, that has been successful in the manufacture of dry clay brick. It is only because we commenced early that we had so large a scrap pile, and we had to go through the experience of two or three systems or machines before we finally got one that gave us some sort of satisfaction. That is the machine we are working today, and with which I am well satisfied though I can conceive that it might be a better machine, and it is possible that before I die I shall become a machine man myself and invent a dry press machine. But the point I got up to speak about is this. I am on both sides of the question. There is something to be said in favor of both sides, but the main feature is that both sides are honest. There are honest mistakes and these should always be taken in the proper spirit. But where one side deliberately tries to deceive and impose upon the other, then there should be a reckoning. That thing is done, and I presume it is done on both sides. The experience I want to relate is a conspicuous one and was related to me some years ago by Brother Purington, and I want to relate it to this Convention as nearly as possible as he related it to me, and if I do not state it correctly, then he can correct me. It is simplv a case of how one machine man, at least, benefited Brother Purington. A number of years ago, I am not certain as to the time, Mr. Purington told me that a man went to his plant at Galesburg, and went out to the shale bank where they were digging their shale with picks and shovels, and after watching the men awhile, he said, "Mr. Purington, I would like to make an agreement with you to bring a steam shovel here and do this work of getting out your shale which you are doing at such great expense and under such difficulties." Brother Purington looked at the man as though he thought he was crazy, and I do not know that you could blame him, and told him he did not think he could do the work with a steam shovel, and then the man made a proposition to bring a steam shovel there and set it to work and if after a fair trial Mr. Purington did not want it, he would take the shovel out, and Mr. Purington would be at no expense in the matter, and if he was satisfied with the machine, he could pay $6,000 and let it stay. Mr. Purington accepted the proposition, and the man brought the shovel to Galesburg and put it to work, and it was only in that shale bank a few days until Mr. Purington told the man he was satisfied and paid him his $6,000. In telling me of the incident, Mr. Purington said, "Mr. Ittner, I found I could get the clay from my shale bank to my pulverizer for less money than it cost me to sharpen my tools." That is what one machine man did for Mr. Purington. (Applause.)

W. A. EUDALY, Cincinnati, Ohio.

Mr. W. A. Eudaly: I have listened to this discussion with a great deal of interest as I have to many discussions. I have attended, as many of you know, not only our National Conventions, but our State Conventions, and I have heard the machinery men sneered at a great deal. I have known the time when such a paper as has been read here today would not have been tolerated for a moment. There have been three very excellent papers. To my mind if you will read between the lines of Mr. Purington's paper you will see that he brings out the same points that Mr. Chambers does. Of course as has been remarked in regard to Dr. Converse's paper for the kind of a paper it is, it is very excellent but it does not pretend to take a serious part in the discussion of this subject. It has been remarked this afternoon that there were two sides to this subject, and it has occurred to me during the reading of the paper and discussion that has followed that the time has come when we would no longer speak of two sides, meaning the brick manufacturers and the machinery manufacturers. I was more than delighted with Mr. Chambers's paper. Some of the things brought out, I think about right. For instance, so many people put money into a small brick plant and then put themselves up as managers. I have known brick plants where we could hardly count the managers, and they insisted upon making the capacity of the plant far in excess of the demands of the community, and I have known cases where the stockholders want to build plants of twice the capacity that it should be. So I think the points brought out by both these papers are timely and will bear reading and re-reading. They come so near to the experience of the manufacturer and the men who sell machinery. I was also very much pleased with the history given in a general running way in Mr. Purington's paper. I was delighted with his paper and felt like giving him a vote of thanks, for the delicate sort of way which he brought forth these things. I trust you will all reread these papers many times, and I think we can safely say that a large number of men interested in the manufacture and sale of machinery and the men interested in the brick industry stand shoulder to shoulder in advancing this cause which we are all so much interested in. We are practically one, we all have the same thing in view, and I am glad it has come to that. (Applause.)

W. P. Blair: It has been impossible for me to quite make clear what we are expected to draw from these papers, except what we can reasonably draw from all of them. We first have read to us a history of the progress and growth of this Association. We then hear what the machine man has done for us.

We then have Dr. Converse's paper—you may say it was not handled seriously, still there was in that paper from the beginning to the end a serious thought, in spite of the mirth and amusement it provoked. I want to just give this one thought, drawn out from all these papers and not a reflection upon this Association as a body, but a thing for us to take hold of. It is somewhat along the lines suggested by Mr. Gates, almost afraid to speak above a whisper for fear his own boys would hear what he said. One reason why the members of this Association have not done more for the machine man is not because they were not willing to do more than they have and receive a tenfold pay, but because they were unable through their ignorance, if you please, and through their lack of education, their lack of skilfull training that must go to make up the equipment of a well trained clay man. I do not know where we will get these men if not through our boys. They can sit down and discuss intelligently with the machine men their mechanical ideas. When we are able to do that, gentlemen, the progress and the development of the clayworking industry will increase tenfold more in the future than it has in the past. (Applause.)

J. M. Blair: I would like to extend to the Convention an invitation to visit the Chamber of Commerce in a body any day between half past twelve and half past one.

Secretary Randall: I have a letter form the Builders' Exchange of Cincinnati extending an invitation to the Convention to visit their rooms. I also have a few letters from absent members, which I know you will be interested in.

CINCINNATI CHAMBER OF COMMERCE AND MERCHANTS' EXCHANGE.

Mr. T. A. Randall, Secretary National Association of Brick Manufacturers, Grand Hotel, Cincinnati:

Dear Sir—On behalf of the President, Mr. Samuel Bailey, Jr., and other members of the Board of Directors, an invitation is hereby cordially extended to members of your Association to visit the Chamber of Commerce, at their convenience, during the sessions of your body.

Truly yours,
C. B. MURRAY, *Superintendent.*

Cincinnati, February 1, 1904.

THE BUILDERS AND TRADERS EXCHANGE.

Mr. T. A. Randall, Secretary N. B. M. A.:

Dear Sir—The Builders and Traders Exchange of Cincinnati desire to extend to the delegates of the N. B. M. A. Association the courtesy of their rooms and would be pleased to have the members visit our rooms during their stay in our city.

Yours respectfully,
ARCH'D COLTER, *President.*

Cincinnati, O., February 3, 1904.

Letters from Absent Members.

A CHARTER MEMBER'S GREETING.

My Dear Randall—I was very sorry illness prevented my attendance at the meeting of the N. B. M. A. I had looked forward to be there with so much pleasure, and I assure you it was a great disappointment to be debarred from the enjoyment. Kindly offer my congratulations to W. S. Purington on his election to the Presidency, and also regards to all friends. Hoping you will have a good time.

Williamsburg, O. B. W. BLAIR.

EX-PRESIDENT FISKE'S DISAPPOINTMENT.

My Dear Mr. Randall—I am duly in receipt of your favor of the 26th inst., and wish to thank you for your courtesy. As previously advised, I expected to reach Cincinnati Wednesday morning, but since then certain important business matters have come up which will demand my personal attention, and prevent my attendance at the Convention.

Please express to the brethren my regrets at being unable to meet them at Cincinnati, and say, furthermore, that I shall never forget their very kind courtesy to me at last year's Convention at Boston.

I am especially grieved to learn of the death of Mr. Adams. He was a noble man, and our Association has lost one of its ablest and most loyal members. GEO. M. FISKE.

Boston, January 29.

VICE-PRESIDENT PARRY'S REGRETS.

My Dear Mr. Randall—I am in receipt of your favor of Jan. 25th, enclosing working card for Convention week. I have been hoping to be able to arrange matters so that I could be with you, but I simply cannot see my way clear so to do. In addition to regular business, which might prevent my leaving, I am in daily expectation of being summoned to the trial of a suit in which I am one of the plaintiffs, and which I have been pressing for some time. I am informed that if this suit is reached on the list my presence will be absolutely indispensable, and that there is no chance of my opponent asking for a continuance or postponement, and I am not disposed to ask for any favors of him.

It is a sore disappointment to me, as I know the Convention at Cincinnati will be a huge success, that the attendance will be large and enthusiastic, and that much benefit will accrue to the members by its proceedings. I should like to see the boys, and will be with them again next year; I would not mind talking to them for a few minutes. I have some stories that I could tell them; if my sand ran out I could entertain them in other ways; but instead I must content myself with offering this sentiment to the Association, "Don't get cold feet."

Boston, January 30. JOHN E. PARRY.

Secretary Randall: I would also like to say that the banquet occurs tonight in the main dining room of this hotel. Those of you who have not presented your invitation card to the cashier's desk for his stamp had better attend to this matter immediately after adjournment. The ladies, of course, will be present.

On motion of Mr. Jacob Klein of Baltimore, duly seconded, Convention adjourned until Thursday morning.

SECOND SESSION.

Thursday Morning, February 4, 1904.

President Purington: The Convention will please come to order. I will ask Secretary Randall to announce the order of business.

NATHAN STEDMAN, Aurora, Ind.

Secretary Randall: It has been deemed advisable to transpose this morning's and tomorrow morning's sessions. Mr. DeLong is not ready to read his paper this morning, and if it is the will of the Convention we will now take up the programme as prepared for Friday morning.

P. J. Connell, Holton, Mich.: I move we adopt the Secretary's suggestion and substitute tomorrow morning's session for this morning's.

Seconded and carried.

Secretary Randall: The first number on the programme is "The Face Brick Proposition," by Mr. J. J. Koch, Shawnee, Ohio. Mr. Koch is here in the hotel, but there is a meeting of the members of his firm that he has been requested to attend this morning, so I will ask Mr. Shellenberger to kindly read this paper for him.

THE FACE BRICK PROPOSITION.

By J. J. Koch, Shawnee, Ohio.

Gentlemen of the Convention:

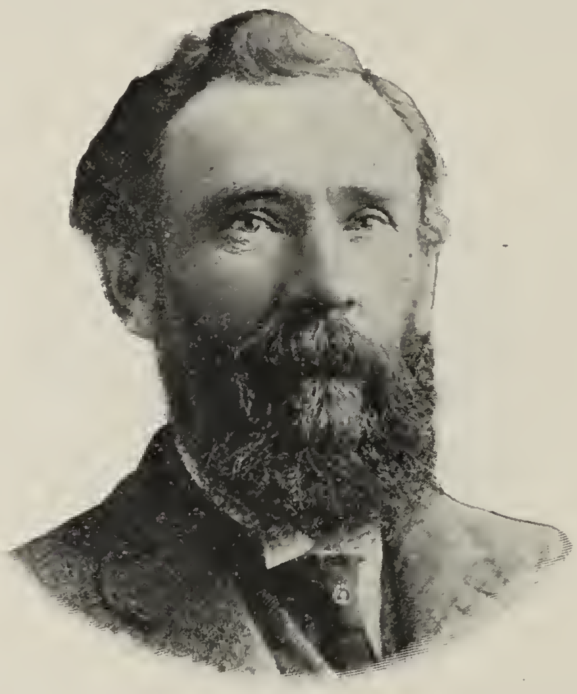
The "Face Brick Proposition," by the dry clay process, is a very seductive one on the face of it; it presents very alluring profits in proportion, as to the amount of capital invested, and the apparent simplicity of the whole manufacturing process, as summarized in brief, all that is necessary, is: to harvest the clay, make the brick, set and burn them. This concludes the manufacturing part of it and then comes the financial end, that is, sell the brick at a profit.

Let us take up the clay question first. Every face brick manufacturer is on the lookout for good clay. The question of good clay is merely relative to the kind of brick the manufacturer desires to make. One kind of clay is good for red brick, another kind is good for the buff or cream colored brick. Still another kind may be found in stratas, each of different color producing effect, which, when used in a mixed condition, may produce a brick of a very desirable solid color, when the clay has been ground fine or may possibly effect, a mottled appearance, when ground coarse.

Another clay bank may contain a larger or smaller vein of clay, a so-called trouble maker, as regards color and whitewash. By the rejection of this particular vein of clay a perfectly good quality of clay may be obtained from an otherwise useless material.

Manufacturers may also, by blending different kinds of clays, be able to make certain shades and colors of bricks, to enter into competition with brickmakers, who have a clay bank, where favorable conditions exist in a natural way. At some other place, two different kinds of clay may be found, where each kind may be worthless by itself, yet, when mixed, may make the finest quality of face brick of its class, along the lines of the old statement: "Two negatives make a positive" in providing for good clay. The writer recalls an instance in particular, where a plant had been operated under two different administrations, one of which used only shale and the other only surface clay, but failure was the result of both firms. The third party now mixes the two kinds of clay and has as successful brick plant as can be found anywhere.

One ruling about clay, that should be particularly borne in mind is this: Irregular clay, within certain practical limits will produce irregularity as to both color and quality.



J. J. Koch, Shawnee, Ohio.

Judicious experimenting will solve a great many apparently difficult problems along the lines of clay.

As to the question of grinding or pulverizing clay; one brickmaker will tell you that he would not have a dry pan on his yard, another one will tell you that a dry pan is the only thing and that he would not have a disintegrator for a gift. Yet look at the trade papers. Dry pan and disintegrators advertised and sold too, to people who use them successfully. The moral is: Buy a grinding machine that is adapted to your clay.

In taking up the question of screens, if you examine the different types as in only two classes, the inclined and revolving, you will be able to find a suitable screen for your clay, although a party may come along and tell you: "Why, I had those screens put in and could not do any good with them. Had to tear them out." And why? They were not used under the proper conditions, as to the character of the clay.

With clay steaming, the same condition holds good; just because one condemns clay steaming as unwise, does not necessarily condemn clay steaming per se. The writer knows of cases of failures as well as successes attendant upon clay steaming.

The next question to take up is "Presses." On the press question your humble servant had actual operating experience with twelve different kinds, varying from the hydraulic press to the simplest mechanical brick press and will state that he has found good features in every one. Take up the trade papers, scan the advertisements and you will find quite a number of second hand presses for sale. Why? Simply because failures have been recorded against them. Is the press to blame, or is it because faulty judgment has been used in its selection as to the characteristics of the clay? Why is it that one man will tell you: "My dear sir, the first press of this make was bought by me twelve years ago and you see, I have four more in use of the same kind." That is a good record for the press. Buttonhole another brickmaker and he will tell you that this same certain kind of press is good for only the scrap pile.

As to the writer's experience with the hydraulic brick press, would say that the maximum pressure varies with the different kinds of clay. He has worked up clay that necessitated 3,000 pounds pressure per square inch to make a good brick and again he has made brick on the hydraulic press where, with a higher applied pressure than 1,000 pounds per square inch, it was impossible to make a good brick.

It is assumed that hydraulic pressure is the most serviceable agent to move heavy weight ergo producing pressure, as if the pressure could not be attained, the resistance of the weight could not be overcome. The same ruling holds good in making brick, in that the resistance of the clay in the molds governs the pressure, relative to the friction of the clay particles upon themselves, the attendant friction of the clay against the mold, and the resilient cushion of the air contained in the clay, if proper means and time period have not been allowed for it to escape.

Hydraulic presses with their attendant accessories, such as pressure pumps, air chambers, etc., are costly machinery and require skilled mechanics to operate them. Is a hydraulic press a judicious investment, when an inexpensive mechanical press can do the work just as well? Or, is it judicious to change a four-mold mechanical press to a two-mold, to enable the operator to obtain the necessary excessively high pressure to make a good brick from a particular kind of clay?

That both groups of presses turn out good brick is evidenced by the fact that bricks made on either type of presses come into competition with each other.

Again, the writer is acquainted in a brickmaking center, where a certain make of press is used on several plants, and the conditions of clay, fuel, kilns, etc., are practically alike. Yet in one county these presses are giving good satisfaction and in the adjacent county are pronounced hopelessly worthless.

On the problem of setting, no definite rule can be set down, as the proper way can only be determined by tests governed by the character of the clay. Some of the bricks have to be set in bunches so as to split up in piers, some kinds can be tied together as they will settle during the burning in unison. Some can only be set comparatively lower than others to get good results. Some other kinds can only be set in certain parts of the kiln, to give you the shade you desire.

Some kinds can be set quite tight, as proper flue is effected through shrinkage by burning. Some kinds have to be set quite open as the ware may only attain minimum shrinkage.

Burning is conjunctive to setting. As a preliminary statement, would say, that in my initiation to a brickmaker's life, one fact was very effectively impressed on my mind by an officer of the largest brick corporation in the United States, to-wit: "Always bear in mind that a well made brick poorly burned is not of much value, but a poorly made brick if well burned is a commercial commodity," and ever since that time I have had a warm spot in my heart for the brick burner.

In taking up the kiln question it is perhaps well to divide them into two classes, the up-draft and the down draft, their selection being governed by the character of the clay and the surrounding market for culls and common bricks. The writer has seen up-draft kilns burned, that contained a very large percentage of good, first-class face brick and the plant made money, because their clay matured at a comparatively low temperature and a handy market existed for common brick and culls.

Square down-draft kilns, when the higher temperatures are required, have proven very successful in burning face brick, in that, the brick that are the hottest are the ones that have to carry the least weight, and the unsightly kiln marks are eliminated to a very large degree.

Besides, the risk of "flashing" is practically reduced to the minimum as regards to the round down-draft kilns. Upon investigation, it will be found, that all the different constructions of either type of kilns have good features, and it would be unjust to condemn a certain kiln, because a brick burner was not successful with it. It is easily understood that when an inventor originates an improvement, it is done with a view to overcome a certain difficulty or a defect existing in former construction. Kilns of a certain type are not adapted to burn all kinds of brick. Oftentimes even in a proper type of kiln, unsuccessful results can be overcome by changing the furnaces, in order to adapt the same to the class of fuel to be used, or by changing the flues, in conformity to the demands of the proper draft and stack.

It certainly ought not to be a matter of great difficulty to select proper machinery and appliances for carrying on the Dry Clay Face Brick business, if due diligence, judgment and caution be exercised in obtaining only such machinery, etc., as are adapted to your clay.

To my mind one of the best plans to get information is at the

Convention of the N. B. M. A. The members, as a whole, are broad guaged men. Solicit their opinion and you will in all probability find some one who has combatted the very evil successfully you are contending with and he will put you on the right track. It has been done before and it can be done again.

With the progressive brickmaker, the day of secrets is past and on his plant the ominous sigu "No Admittance" does not exist. This statement is practically reinforced by an article appearing in The Clay-Worker, page 130, August, 1903, where it reads: "He attended the National Convention held at Indianapolis, went over the ground with the old time brickmakers, whose acquaintance he made there and concluded, that his salvation depended upon a cheaper method of burning. To be sure of his ground, he visited a number of plants and scrutinized carefully every feature of the work, etc."

Now there was a man, a merchant, who knew nothing about the brick business, he obtained reliable information and data to place himself on record as a succesful brickmaker.

The writer also recalls to his mind a paper read at one of the N. B. M. A. Conventions bearing on the topic: "Brick Burning," which covered and embodied all the successful features of good brick burning. Intelligent study of this particular paper, has been the medium of educating quite a number of burners.

Face brick are made today by both the wet and dry clay process and the products are in competition with each other. The writer uses the dry clay press brick process in preference because he believes a more perfect brick can be made by it. It is with ease and with but little care, a face brick can be made perfect in shape, good sharp corners and edges, but at a slightly higher cost than with the mud brick process, owing to the extra weight of clay in each brick, which additional weight, is certainly an important factor to overcome excessive shrinkage and enable the brick to stand up better in the fire.

In the Western and Middle States the art of making face brick by the dry clay process has been brought to a very high state of perfection and many beautiful buildings have been erected with them. In the East, dry clay brick have not found favor very much, as they are not as impervious as face brick generally are, which are made by the wet or mud process.

Yet in the past few years processes have been put to use that practically furnish as impervious a brick as by the mud process.

The consumers and users demand, and by their right too, that a face brick be of good shape, having sharp corners and edges. As to the question of shading, it is no longer demanded that the shades be as finely graded as formerly. It is sufficient to effect a harmonious blending of shades, just enough distinction so that the "Paint Pot" appearance is destroyed and no monotonous color is shown to tire the eye.

One of the fatal mistakes often made is to tax all appliances beyond their reasonable capacity. A press taxed beyond its capacity cannot make a perfect brick; the truckers and setters cannot handle them properly, owing to this rushing; the burners will have to crowd the burning, as the kiln capacity is deficient, and the brick are sure to be imperfect. Can any one expect any thing else but a large percentage of second quality?

What is the result? The manager has made a record of the quantity as against the quality, but the financial outcome will not make a good showing, as low quality of brick always induces a low quantity of dollars and cents.

One of the necessary accompanying evils to the face brick business is the fancy brick department. This department has the peculiarity of generally *not* having in stock some certain pattern that an architect specifies, no matter how large a stock one carries.

Another bugaboo in the face brick business is the selection of bricks for mantelpieces, as they always have to be of the very best quality and the trade practically demands such perfection in these mantel bricks as is ordinarily demanded in art pottery.

It is very seldom that a face brick plant can place its whole output in its immediate vicinity and is to a great extent dependent upon its shipping demand.

The shades or colors required for the shipping demand are governed by the colors of bricks manufactured in each respective locality where they are to be used.

For instance, in a section of country where light colored brick are made, darker shades would only be imported and in other sections where dark brick are produced only light colored brick would be imported.

Thus, a face brick company having only one line at their command, would be limited to certain localities owing to the above mentioned color line, therefore to be eminently successful, face brick manufacturers should be able to cater to both conditions.

But he must be in position to cope with other manufacturers, both in quality and color. He may have the means at hand and not know it, he may not have the inclination or time to experiment to obtain results with materials close at hand and right here I want to state, at this stage both the theoretical student and the practical worker should join hands to put the brickmaker on the successful basis of operation. I am positive it can be done. I know that owing to my techno-chemical in my younger years combined with my actual experience of the last twenty years, has enabled me to solve problems quite rapidly, which, under other conditions, I might never have been able to solve, or perhaps only after long wearying of exhaustive experimenting.

As an illustration: A certain plant that I was connected with made only red face brick. The trade was very slow as buff brick were in demand. The only way open was to ship in clay to make buff brick; but this clay had an unpleasant property of letting its brick turn green in the wall, practically being a condemning feature when the selling qualities were mentioned. By judicious reasoning and a few experiments the problem was solved in this way: that we used a portion of our home clay with the imported fire clay, changed the process of manufacture, which enabled us to overcome the freight charges on the imported clay. But the best result was that our buff brick never turned green in the wall and had a purer color than the brick made from the imported clay itself. Thus, our concern were equals as to cost and superiors as to quality.

If any certain brickmaker needs the service of the techno-chemical student, it is the face brick maker. The progressive brickmaker realizes this and is not alone asking, but is anxious to listen to and take advice from the student. It is indeed a fortunate condition of affairs, for the practical clayworker, that quite a number of State Universities have anticipated their wishes and necessities by establishing branches and studies in the ceramic arts.

At the present time, when competition is close and high standards of quality is the rule, it absolutely becomes necessary for the practical worker and the students to join hands in order to meet requirements that have to be met, owing to new factors put forth by the progressive brickmaker's competition, or as Brother Binns puts it, according to the title of his paper, "Out of the Beaten Path."

I should like to take up the financial end of the face brick business, but shall not do so for two reasons, one being that Brother Hodgman in his paper, "The Financial End of the Brick Business," will undoubtedly cover the ground practically, and the other one is, that this paper may be too lengthy (and perhaps it is) so as to tire the patient fellow brickmakers and members of the N. B. M. A., to whom the writer extends thanks for their kind attention. (Applause.)

Anthony Ittner, St. Louis, Mo.

General Discussion.

President Purington: Mr. Herbert of Nashville, can probably give us some light on this subject.

T. L. Herbert, Nashville, Tenn.: I do not know that I can add anything to what has been said in that paper. Mr. Koch has covered the ground pretty thoroughly. The manipulation of clay in the making of brick by the hydraulic system has always been a very important part. The clay must be properly prepared. As I have said, Mr. Koch has covered the ground so thoroughly in his splendid paper that I do not know that I can add anything to it.

Mr. Ittner: I coincide with Mr. Herbert that this is such a good paper and covers the ground so thoroughly, so fully, that discussion is almost useless, and the time of the Convention as it proceeds is valuable. There is only one point in that paper that did not strike me as quite right, and I presume the wrong word was used. In speaking of setting the brick, he said set the brick "tight." I presume he meant set the brick "closer," because if you set them tight, you could not burn them at all. It is possible that I did not hear the paper just right and it is not subject to the correction I make. If the brick are set tight it shuts off the draft, but the brick should be set close because when your heat begins to go up through the body of the kiln and the heat becomes intense, the brick shrink and the spaces between the brick become greater. I think this is a very good paper.

President Purington: If there is no further discussion I will ask the Secretary to announce the next.

Secretary Randall: The next is a paper, "Out of the Beaten Path," by Prof. Charles F. Binns.

OUT OF THE BEATEN PATH.

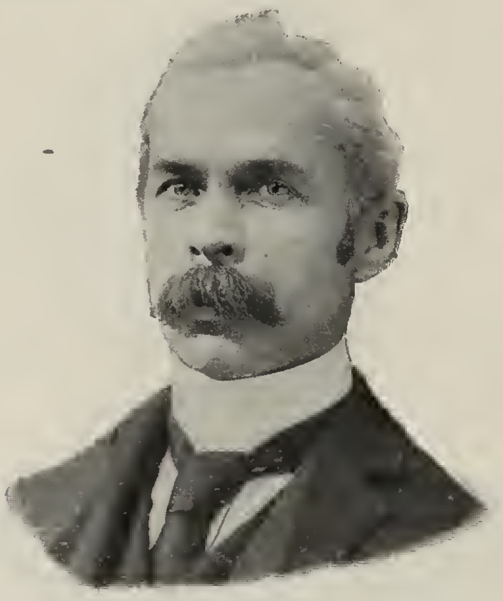
By Prof. Chas. F. Binns, Alfred, N. Y.

Gentlemen of the Convention:

Did you ever hunt rabbits in the snow? It is surprising what a number of tracks a rabbit will make. Here and there, over the hill and through the swamp. There is no suggestion of a beaten path until you come to a hole and there the tracks unite in a well trodden run. One who enters upon his first hunt without previous study is very apt to track his rabbit the wrong way. He sees the small print of the fore feet and the large print of the hind feet and he thinks "surely the small ones must be in front." He is mistaken as he will presently find.

Which things are an allegory?

The world is full of tracks and here and there they unite to form roadways, beaten paths which are traveled again and again by common usage and consent. These paths, moreover, are seldom found far away from home, from the more familiar of our surroundings. Away on the hills of original thought or in the deep bottoms of scientific research there are a few tracks, but they are only the footsteps of a single individual—they are not beaten paths. There are some paths from which we would not care to depart, there are others which it is not safe to leave.



Prof. Chas. F. Binns, Alfred, N. Y.

The path marked by the ten milestones of Sinai has been trodden by countless generations, and will be followed by as many more. It is the only safe path of moral life. The path marked by marriage and the sanctity of the home is one in which we all tread with pleasure.

But we are more concerned at the present movement with the paths of business life. There are times when it is wise to follow the well worn road, there are times when the conditions demand that a new track shall be broken out.

Workers in clay are proverbially conservative. For the most part they dislike to try new things and sometimes suffer for this reluctance. Perhaps it is one of the little ironies of life that this should be pointed out by an Englishman to a gathering of Americans. We regard England as the home of precedent and tradition and glory in the fact that here we are free.

One who flatters himself on his smartness says "I know a good thing when I see it," but it sometimes happens that if that good thing is new, prejudice blinds his eyes. In fact the perception of a good thing is sometimes dependent upon the good of it being proven by somebody else. And yet it is plain that it is sometimes beneficial to step out of the path. A berry picker knows well that the way to find the finest fruit is to plunge into the tangle where no one else has been; the prospector for gold wanders off into the wilderness and seeks for untrodden wastes. There is sometimes more profit in solitude than in company.

Two things are necessary in the modern clayworker—the man, not the journal—knowledge and enterprise.

Maybe there are some who have neither, who have dropped into some "soft snap" and are not anxious to stir things up, but this is a rare condition—happily.

There are some who have enterprise, but little knowledge. The men of the old school who have fought a stern battle with the world have wrung from it a reluctant subsistence. They began with little, they sought but little, but what little they have is well earned. All honor to them in their struggle, for they are the salt of the earth. There are also those who have knowledge but no enterprise. Knowledge, in the sense of learning, is plentiful nowadays, but those who have it still have much to learn. A good many attempts have been made to define an educated man. I think he is one who is ready to receive an education. A college man comes forth to face the world. What has it in store for him? Smiles and caresses? Yes, if he be wealthy, but hard knocks and cynic scorn if he be poor. His education must show him how to grapple with his opponent, how to turn events to his own advantage and to rise superior to circumstances. Thus he will be on the high road to knowledge and his enterprise will depend upon his personal equation.

A few attendances at these conventions will marvelously quicken a man's powers. There is inspiration in the grasp of your hand and in the gleam of your eye, for as iron sharpeneth iron, so a man sharpeneth the countenance of his friend.

"Knowledge comes, but wisdom lingers," said Tennyson and if we are to get wisdom, knowledge must be the first step.

While it is not certain that schooling imparts knowledge, it may be taken for granted that in most cases it does so and at any rate it is the most usual form in which the acquirement of knowledge is presented to us. The attitude of one's mind then towards education is a fair test of one's estimate of the value of knowledge.

These are days of education. Never in the history of the world has so much money or such deep thought been bestowed upon schools as in this twentieth century and in these United States. The greatest possible pains are taken in the training of teachers and it would seem as though there remained but little to do in the perfecting of our common schools.

This work is regarded by some as a mere means of spending money and providing places. Let us hope there are none such here. To the thoughtful man the schools are the hope of the country and if this be true in general lines it is also true in detail.

This association has done well in assisting in the provision of special technical instruction, but its responsibility towards the school for clayworkers is not thereby discharged.

To illustrate this point let me quote two cases which have recently occurred.

An inquiry came from a western firm for a graduate student who was capable of taking charge of the chemical laboratory and of managing the technical end of the business. In the course of negotiation this statement was made, "We do not expect a detailed knowledge of the manufacture, we can give him that, what we want is a scientific training as a basis to work upon." Within a very short space of time a second inquiry came couched in similar terms, but a correspondence brought forth this statement, "We have decided to engage a man with practical experience rather than a student from one of the schools." The firm last mentioned is diligently pacing the beaten path. An imaginary abyss yawns on either side and only those who have trodden the path before are eligible to travel it again. In the former case there is no such prejudice; a new track may be an advantage, anyway we need new blood.

In the "Letters of a Self Made Merchant," there is, among many pithy passages, an account of a young man named Jim who launched his employer upon an advertising campaign. He was successful and his chief said, "Jim was all right in his way and I hadn't been broad guaged enough to see that it was a better way." Sooner or later we must admit the possibility of the other fellow being right and sometimes the sooner the better.

A great deal of the success attained by Americans in the commercial world is due to their ability to disregard precedent. The Yankee dares to do something which has not been done before, or he dares to do an old thing in a new way.

But in what way can we change? We must shape our wares, we must have machines, tools, dryers and kilns. Is there any possibility of a radical departure from precedent?

In reply let me ask whether any man can declare that finality has been reached. In my humble opinion we are but at the beginning of the development of our clay resources. There are more things which we do not know than there are things which we do know.

For example, in the preparation of clay, both wet and dry, why should not the principle of the wet pan be made continuous instead of intermittent? We have not arrived at the best method of cleaning and tempering. In dry grinding why should not the plan of the tube mill be adopted? Or, a perforated tube will be constructed to grind and screen at one operation.

In the manufacture of brick it should be perfectly feasible to perforate the center and save one-half of clay, fuel and freight. Roofing tile might surely be expressed from an augur machine and cut by wire. The use of the continuous kiln is still somewhat of an experiment and yet the economy effected by it is a full justification.

David Harum said that the right course of action was to do to your neighbor as he would like to do to you and "do it fust." Without confirming the ethics of his statement it is certain that to "do it fust" is a main constituent of success. (Applause.)

General Discussion.

President Purington: I will ask Mr. Gregory to lead in the discussion of the paper.

M. E. Gregory, Corning, N. Y.: It seems to me hardly proper to call on me to make remarks on this paper read by so able a man as Prof. Binns. You all know his experience and ability. However, the theme outlined by Prof. Binns is one to which we can give due consideration and thought. Very few of us here have the technical training of Prof. Binns. It is demonstrated to us day by day as a fact that men with technical education at the present time are willing to give advice to those of us engaged in the manufacture of clay goods. If we study the latest methods, follow them up, and experiment with them, we will get results. We should be on the alert to get all the new ideas and schemes that are developed by the men of technical education who give us suggestions from time to time. A few years ago the average brickmaker did not want to know anything about any one else's method; he had a method of his own and did as best he could with it, and it is largely due to the work of the National Brick Manufacturers' Association that we have realized that we are not only competitors, but fellow workers. We are all working for one object, and that is the advancement of one of the grandest occupations in the world. I believe our occupation is in its infancy and that we can make as many improvements in our line as have been made in the manufacture of iron or steel, if we give the work our thought and careful attention. I believe we should avail ourselves of every opportunity in this line possible.

President Purington: If there is no further discussion, we will pass on to the next.

Secretary Randall: The next in order is a paper on "Mechanical vs. Hand Method of Handling Clay," by A. F. Smith, of Brighton, Pa. Mr. Smith is not here, unless he has come into the room within the last few moments. If he has I wish he would come forward. I have a paper which he has prepared, which I will read for him. He has probably been unavoidably detained, as I know he intended being here.

MECHANICAL vs. HAND METHODS OF HANDLING CLAY.

By A. F. Smith, New Brighton, Pa.

Gentlemen of the Convention:

The writer realizes the responsibility resting upon him in attempting to prepare a paper on a subject of so much importance to the brickmaking craft. In doing so, he has labored under the hope that in the discussing of any mistakes he may make, some points may be brought out which will prove mutually helpful to himself and to the members of this Convention.

The subject, "Mechanical vs. Hand Methods of Handling Clay," is certainly well chosen and one which is of vital importance and interest to every brickmaker. It properly applies to any mechanical means of moving clay. However, it is the writer's intention to confine this paper to the "Steam Shovel Method," as it is one of the best modern methods and the method that is used by us at our own shale yard.

As the cost of handling clay by any method depends largely on the conditions under which it has to be done, there may be some conditions under which the steam shovel would be placed at a disadvantage. For instance, ordinary clays of shallow depth are easily handled by a spade; and for small outputs, say up to 20,000 capacity per day, some other method, perhaps the plow and scraper, would do better, or where the clay is very soft and plastic, and apt to be sticky and therefore not easily removed from the dipper, the shovel may not show up to such good advantage.

On the other hand there are so many conditions under which the shovel can be worked to good advantage that we feel safe in saying that under the average condition and for outputs of 20,000 or over, there is no method that can compete with this.

They tell a story about Pittsburg that when Flinn put his first shovel to work, one of his men looked it all over and watched it work for awhile and remarked, "Oh, be jabber, yez can bait anything at handling dirt, but you're no good to vote."

There is bound to be some objections raised no matter how good a machine we have. One of the objections to a shovel in a shallow pit is the amount of space to travel over and the consequent time lost in moving; also for a small output, the expense of operating. Most shovels require two high priced men to operate. Both of these objections are overcome to a large extent by the Thew Shovel, which on account of the horizontal dipper motion and increased crowding range, makes the machine effective in shallow work, where the usual excavator type will not give satisfaction and the simple arrangement of the operating mechanism only requires one operator. This is one of the great advantages of handling clay with a steam shovel; even with the ordinary type of shovel, that requires two men to handle.

Instead of one man for about every eight yards of material loaded, there is needed only one, or at most two men; and with the present conditions of the labor market the fewer men there are about the plant the more work will be accomplished; and the class of men usually hired to handle machinery will give less trouble than those ordinarily found in the clay pit.

The shovel can work under all conditions of weather, does not quit at the first drop of rain, nor get sick on hot afternoons; will not go on a strike and is always ready for work after pay days and holidays. While it must be provided with fuel and water, it does not drink to excess and consequently is never unfit for work for that reason.

In shales or other material that is too hard to dig with a pick and where the bank is from eight to eighteen feet high, the shovel has a number of advantages over hand methods among which are the following:

M. E. Gregory, Corning, N. Y.

A 25-ton shovel will dig and load all the shale required up to outputs of 150,000 and if you have facilities for getting it to the machine, you will not have to wait for clay.

The material is delivered in better shape. This is very noticeable in banks where all or part of the material is sticky after being wet. The usual hand method is to fall a large quantity at a time. If this is not cleaned up and there comes a rain, it is often nearly impossible to get it through the pan without clogging the plates. The shovel overcomes this in digging just what is loaded. This is yet more noticeable in starting up after a shutdown. If some of the face has caved off, and become wet and sticky, the shovel will mix this with the dry hard bank.

This mixing of the material used, is in itself considered by some of our best brickmakers to be sufficient reason for using a shovel even under conditions where there is nothing else in its favor.

Where a shovel is used it is found that that the product is a more uniform color and size and less loss on account of the uniform and thorough mixing from bottom to top of the bank.

The next point to be considered is the cost. As the cost of labor and fuel vary and the cost of moving clay also depends so largely on conditions under which one is situated, it is a difficult matter to give figures that will fit all cases. In our own case, we calculate that the cost of machine, allowing ten per cent. for interest and depreciation; one-half ton of coal per day, and one man to operate, is $5.00 per day, provided shovel works every day. Five dollars per day will not load a large amount of clay.

Our shovel has been in almost constant use for over a year and much of the time under very severe conditions. The repairs amount to $53.46, $30 of this was for boom sheaves broken by overwinding. Two of these are reserve sheaves kept as a precaution. In noting the cost of repairs for nine shovels taken at random, it has been found that the average for one year is about $60. Therefore it can readily be seen that the cost of repairs is not very great when compared with the amount of work done. In handling as much material by hand the bill for shovels and picks will amount to considerable.

With our shovel, which is a Thew No. 1 type, and one man on the ground, at $1.50 per day, in addition to the engineer, we have loaded 155 one and one-half yard cars in ten hours, and had we been able to keep machine supplied with the empty cars, would have loaded more. This was in hard shale which would have required blasting had we been doing this work by hand. With this shovel and one man on the ground to help move, it is as easy to do as much as twenty-five or thirty men.

We calculate that it is a saving of twenty men at say a cost of $1.50 per day, equal to $30 per day. This is making a liberal allowance for all expense of repairs, depreciation and interest on investment. In the opinion of the writer, under any conditions where a brickmaker requires an expense of five or six dollars per day to load his raw material, the balance sheet at the end of the year would be in favor of a shovel, and the assurance that he would have ample supply of thoroughly uniform mixed material at his command, under all conditions of weather, labor, etc., with which we have at times to contend, would in itself justify the installation of some mechanical means of handling raw material.

It is acknowledged by all that when the brick machine stops, the main part of the business is stopped. With a good shovel and operator—and these are not hard to obtain—and some good means to move raw material to the grinding machine, one would never need to stop for want of clay.

W. H. HUNT, Cleveland, O.

As stated in the beginning, I have confined myself to the method in use at our works in the hope that the members will give the Convention the benefit of any economical method with which they are familiar. (Applause.)

General Discussion.

President Purington: So far as I am concerned, I do not think there is much chance for argument, as the shovel is by all means preferable to hand method of digging shale. Possibly there is a difference of opinion. Both Mr. Butterworth and Mr. Barr have had experience along this line, as has also Mr. Hunt. We would like to hear from Mr. Hunt.

W. H. Hunt, Cleveland: All I would say is that I thoroughly endorse that method of gathering the clay. It is so clearly the best way of handling the clay that I am surprised that any plant making 20,000 or more brick per day should dig their clay from their bank in any other way. The point made by the paper of the assurance of a uniform condition of the clay is alone sufficient to justify the use of the machine. It enables you to always have a uniform, steady supply of raw material. We formerly blasted our clay with dynamite and shoveled it into carts and by doing so we were of a necessity working for two or three days on clay that was more or less disintegrated and then another day we were working hard clay, but using the shovel we are working both our top and bottom shale at the same time.

Jacob Klein, Baltimore, Md.: You speak of clay and shale, and the paper speaks of shale. How will a shovel work in a tough, plastic clay?

Mr. Hunt: We use the word shale, but our bank is about 27 to 28 feet high, and 10 or 12 inches at the top is shale disintegrated and the rest is not disintegrated and we use the word shale to distinguish the bottom from the top of the bank. We mainly refer to the disintegrated shale as clay.

Mr. Klein: Is it a sticky formation, or granulated?

Mr. Hunt: On wet, moist days it is extremely plastic, but in fair weather it is granulated.

Mr. Klein: Our clay is usually pretty greasy at all times.

President Purington: I will ask Mr. W. H. Swett of Blue Island, to give us his experience.

W. H. Swett, Blue Island, Ill.: I have had about seventeen or eighteen years' experience in the use of steam shovels almost altogether in the handling of Chicago clay, and at the present time we are dredging our clay out of the lake. If I was making anywhere from 50,000 to 75,000 or 100,000 brick daily, I would use a steam shovel by all means. There is no trouble in digging clay enough for 350,000 brick a day with a steam shovel. You can see for yourselves how many men it would take to dig that much clay by hand in the same time. It would be almost impossible to get that number of men in a clay hole. Of course, for a small brick yard making only 20,000 or 25,000 a day, it might be cheaper to use hand labor, but you can certainly mix your clay better with a steam shovel than by hand.

T. L. Herbert: For a man making 50,000 or 60,000 a day you think the steam shovel is the best.

Mr. Swett: Undoubtedly. There is some objection to the time it takes to move the shovel, but there is no trouble about shutting down your brickyard about three or four o'clock in the afternoon and then be ready to start the next morning. We always did that, and I think our President will bear me out that we found it an easy matter.

Wm. Moore Angas Jacksonville, Fla.: What is the weight of a large shovel?

Mr. Swett: The shovel we are using weighs 160 tons. You can get a shovel of almost any size or capacity.

Mr. Angas: What would be the weight of a shovel for a brick yard of, say, 50,000 capacity?

Mr. Swett: About 25 tons.

A Member: How many men would it take to compete with your dredge in the lake? (Laughter.)

Mr. Herbert: What is your experience in regard to repair bills?

Mr. Swett: Of course, you have to keep your steam shovel in good shape the same as any other machinery, but there are no expensive repairs in a steam shovel. Your chain will wear out in course of time, two or three years, just like any other tool you use. You certainly must keep everything in good repair, not only on a steam shovel, but every where about the plant. I should judge that at the Purington yard, I mean the yard at Purington, Ill., it cost about $75 the last year for repairs. That is the only yard I know much about.

Prof. Binns: Would an estimate of ten per cent be sufficient to cover repairs?

Mr. Swett: Yes, sir.

Secretary Randall: The repair bill probably amounts to no more than the supplying of shovels and tools for digging the same amount of clay by hand, does it?

Mr. Swett: Probably a little more, but you get better results.

President Purington: The number of days you can work with the steam shovel compared to the hand labor counterbalances the difference in repairs, etc. We would like to hear from Mr. Crook.

Charles M. Crook, Youngstown, Ohio: I have run a steam shovel for several years, one 65-ton shovel and one 90-ton shovel.

The steam shovel unquestionably will handle any material that can be handled. We have run them in hard shale and have used them to load limestone. We can cut through the very toughest blue clay wash. I think the paper that was read was a little optimistic perhaps and might mislead some of the members. I would advise every member to investigate the steam shovel question very thoroughly. It is easy to figure out on a yard where it is used. See the number of men and what they are doing and then compare them with your yard and see whether you can do better with it. It is a splendid way to handle shale. A shovel is reliable and works every day but there is a great deal of wear. It is expensive in the first cost. We have one shovel at work now and another is on the way. Of course while the machine is new there are no repairs, but there are repairs that come later.

James L. Breed, Syracuse, N. Y.: I am considerably interested in the question of steam shovels. I wish to ask a question. We have a strata of clay which is plastic, about 16 feet deep. I have had steam shovel men look at it and claim they could handle it. In order to handle this clay I have to spade it up in chunks, and every time a shovel goes into that clay it has to be dipped in a pail of water or else you break the shovel. I would like to ask the gentleman if he thinks we could use a steam shovel?

Mr. Crook: I would say yes, unquestionably. We have in our shale bank a place where a glacial action had left a very tough blue clay that I do not believe you could cut with a shovel at all. We simply had to pick it out in little nodules, and pick it up by hand, and a steam shovel will handle that readily. They will handle any material put against them anywhere. I do not think there is any material so plastic but that it might be handled successfully with a steam shovel. The only trouble we ever found in wet weather was that we had difficulty in holding up our dump, it will run like quicksand. There is no trouble, however, to dig it and get it in the carts.

Mr. Breed: No steam shovel man has come along who said he would put one in and that if it worked as agreed, I could pay him for it. I am willing to make an agreement of this sort, but have never found a shovel man who will take up my proposition. I do not want to put in a steam shovel unless it will do the work. I would like to make a trial first and find out if it would do the work. I would like to go where I could see some clay like mine worked with a steam shovel, and I would go a good ways to see it.

President Purington: Unless the shovel men are extraordinarily busy, I think you will have some of the steam shovel men around to see you soon after they read this report.

Mr. Hunt: In regard to repairs. The shovel that we are using at the South Park yard was put in late in 1895, and was put in operation early in 1896, and the first two years, '96 and '97, the entire bill for repairs on the shovel amounted to $16.80, and the shovel was kept pretty busy through these two years. Since that time the repairs have increased. We have had to put in a new chain, but I do not believe in any one year the repairs have reached $100. There is one point of advantage that has not been referred to. That is, those plants situated in the sections of the country where the labor problem is an important feature, appreciate the necessity of such machinery and appliances as provide the greatest possible economy in the use of men. We formerly had from fifteen to twenty-five men in our clay gathering department, and at the present time we have a ground man, an engineer and two bank men. Four men operate our clay bank, and our transportation capacity is the equivalent of 600 tons a day. Our steam shovel has probably three times that capacity, so the steam shovel has solved the problem of labor in that department of our plant to a very great measure. Our mistake at the beginning was in having an insufficient capacity all along the line. We were always handicapped by an insufficient supply of clay. We would take advantage of the fair weather in gathering by the old process, whereas now we can use the steam shovel under conditions where the hand process was not successful, so now we always have a superabundance of clay. Now instead of having just a sufficient grinding capacity, we have a superabundance of grinding capacity. Then we had an insufficient screening capacity; now, instead of having just enough screening capacity, we have put in a superabundance of screening capacity. So now whether the clay is excessively moist or not, does not bother us any more in grinding or screening, because we have a superabundance of capacity in these different departments. One of the best improvements we have added to our plant in the last two years is the Dunlap screen. After ten or twelve years' experimenting with various screens of other makes, and screens of our own conception, the Dunlap screen has come in and solved the problem. Instead of taking the advice of Mr. Dunlap with regard to the required capacity, we used our own judgment and put in 50 per cent. more than he recommended. Now, we really do not need that 50 per cent. capacity except on certain occasions, and when we do want it at these certain times the surplus capacity is very valuable.

President Purington: Come to Galesburg and we will show you a steam shovel working in a shale bank sixty feet high. I would like to hear from Mr. Bruns.

George H. Bruns, Brecon, Ohio: I am plowing my clay and using steel scrapers. Our clay bank is from eight to ten feet in depth. We plow that clay on an incline from top to bottom. There are different stratas of the clay. It takes three scrapers full to fill a car. We take one from the top, one from the center and one from the bottom of the bank. We have a sort of a bridge built in the clay bank, with trap doors and the cart is run under that and the team goes up on the bridge with the steel scraper and dumps the load through the trap doors into the cars. This scheme is illustrated in the January Clay-Worker. Two men handle all our clay. One man runs the cars and one handles the team, which draws the steel scraper, gathering enough clay to make from 25,000 to 30,000 brick a day.

George H. Bruns, Brecon, Ohio.

President Purington: Suppose a rainy day comes, about the time you have it plowed up?

Mr. Bruns: It stops us for a time, if the rain is very heavy. We have our bridge so located, that we can plow around it. When we want to move the bridge we lay a new track up to the place where we want to move the bridge and go ahead. We have no extra expense, and the way I am situated, I find I am getting my clay cheaper than I could by the steam shovel. I have had a great many brick manufacturers to see me, and they are all of the same opinion that I am, but the thing that would handicap a great many people, is that they are not located as I am.

President Purington: If there is no further discussion on this subject, we will take up the next order of business.

Secretary Randall: This brings us to the questions for general discussion. The first is question 22, "Should Flint Clay

When Used in the Making of High Grade Fire Brick, be Calcined or Burned Before Being Mixed With the Plastic Bond of Clay for Making into Refractory Brick?" "If so, Why?" We have with us a fire brick manufacturer of wide experience, Mr. Talbott, of St. Louis.

Mr. Talbott: Mr. Parker can answer that question better than I can. I think it ought to be calcined by all means, in order to make a high grade refractory brick. It is not absolutely necessary to put plastic clay with it.

Lemon Parker, St. Louis, Mo.: I do not know that I can add much to what Mr. Talbott has said. We always calcine our clays because we believe it necessary to take the shrinkage out of the flint clay before it is put into brick, if we do not burn it in the first instance it will shrink faster than the bond clay which we use. We use ordinarily St. Louis clay for our bond clay, although sometimes we use the flint clay for bond clay, but ordinarily use St. Louis No. 1 clay for bond clay, and that is rather siliceous, whereas flint clay has very little silica in it, and has a higher rate of shrinkage and therefore we burn it before we use it. We have found it has a tendency to keep a straighter edge on the burned stuff. I believe the general idea is to keep your burned ware with as straight an edge as possible. On the other hand I know there are quite a number of manufacturers in the East who do not burn their flint clays. I do not know the results they obtain, but I know with our methods we obtain very satisfactory results.

A. M. Smith, Portland, Ore.

President Purington: These gentlemen are both of the same opinion. If there is any gentleman who differs with them, would like to hear from him. If not we will pass on to the next question.

Secretary Randall: The next question No. 23 reads, "Is a Soft Mud Machine Made Fire Brick as Good in Every Way as the Hand Molded Fire Brick?" What is your opinion on this question, Mr. Parker?

Mr. Parker: I have never had any experience with the so-called soft mud machine. In making our high grade brick we make by hand altogether. But the so-called mud brick process is not used in St. Louis to any extent. I know that for a very high grade fire brick, it is preferable to use the hand mold and repress by hand.

Mr. Ittner: I would like to use a little common sense in the answer of that question. I have never been engaged in the manufacture of fire brick, nor do I ever expect to be, but applying to the manufacture of fire brick, the standard of common sense I have mentioned, I will answer that question in this way. I have always regarded a soft mud machine brick as nearly a duplicate of the hand brick. I have always called them one and the same, in the manufacture of common building brick, and I cannot see why the same principle should not apply to similarly made fire brick. I would say that a soft mud machine fire brick and a hand made fire brick, would be as nearly like one another, all things considered, as two peas, with the exception possibly that the machine brick would receive the most pressure and so be a little more solid, and would weigh a little more than the other, but not very much if made of the same clay and the clay tempered in the same way.

Mr. Parker: We mold our clay very much stiffer than the so-called soft mud brick made by a machine, even though we use the hand process. It is almost identical with the stiff mud brick in consistency and we regard soft mud brick as entirely too soft to go into our brick.

Mr. Bloomfield: In the East the stiff mud machine was introduced, but the fire brick manufacturers have come to the conclusion that it was not the thing for them to use and they have gone back to the old fashioned pit and wheel for tempering their clay for their best brick, and they use the hand method, and the experience of those who use these brick are such that they prefer to give more per thousand for these brick made by the hand made process. I know some concerns which have just recently gone back to the pit and wheel and hand process for their best product.

Mr. Parker: Under some conditions I expect Mr. Ittner is right, but we use the stiff mud process because we can hack the brick next day, and if I understand the soft mud processs you could not do that for several days.

Secretary Randall: The next is question No. 24, "Is the Demand for Harvard Brick Destined to Last?" For the benefit of some of the gentlemen who may not understand the term "Harvard Brick," I will say it is applied to an ordinary red-face brick made in New England, not necessarily repressed, in fact, I guess the real Harvard brick is a hand molded, red front brick, much smaller in size than our western common building brick.

Mr. Ittner: How long has that term been in use?

Secretary Randall: Oh, I expect about fifty years. (Laughter.) The next question, No. 25, "Will Not Any Clay Burned in Old Fashioned Clamps with Wood Fuel Produce Harvard Brick?" dovetails in with this and I will ask Mr. Fish of New Hampshire, to tell us all about it. Mr. Ittner does not seem to want to take my word for it. This question came to me from a brick man in the East.

Mr. Ittner: Well, I don't take your word for it, that that term has been in use for fifty years. I myself have never heard it before.

Ed. B. Fish, Rochester, N. H.: We make the so-called Harvard brick wholly in New Hampshire. I have always understood that the name was originated by a Boston brickmaker whom you all know. The brick were first used in the gates about Harvard College. They have been in there ever since I was a small boy. I am now 34 years old.

Mr. Ittner: Well, that's not fifty years.

Mr. Randall: I said, *about* fifty years. (Laughter.)

Mr. Fish: The brick were used in New York City most extensively in the Harvard Club, and the Boston brickmaker took advantage of the fact that they were used in the Harvard gates and in the Harvard Club of New York City, and called them the Harvard brick. The original Harvard brick were made in Cambridge. Now in answer to the question I know nothing about your Western market, but there is no question but that in New England, the call for water struck brick will continue for a long time to come—we do not call them Harvard brick, except when we ship them to our friend over there from Cleveland or to New York City, and then we dub them Harvard brick. (Laughter.) Ordinarily we call them water struck brick. They are molded by hand, although some of them are made on the old fashioned Hodge machine, where all six brick are pushed out at once. In hand molded brick, each brick is molded separately. They are a small sized brick and there is no doubt but that in New England there will always be a demand for them. As to the Western trade I cannot speak. As to this last question, "Will Not Any Clay Burned in Old Fashioned Clamps

With Wood Fuel, Produce Harvard Brick?" I would say that the experiences of men who have tried it has not been satisfactory. If a certain brick manufacturer from Connecticut were here he could tell you how he sunk between forty and fifty thousand dollars in an effort to make Harvard brick. He came up to my yard and hired one of my men to go back home with him and paid him a good salary, and he made several kilns of these brick. He had the kindness to send me some of his samples afterward and they were about the bummest looking brick that I ever set my eyes on.

President Purington: Is the rain dropped brick a Harvard brick?

Mr. Fish: I think some people call a rain washed brick the Harvard brick, but our Harvard brick are not supposed to be rain washed. Our Harvard brick are simply a hand molded, old fashioned red brick, about the color of mahogany, and I understand it is the color that pleased the architect. The dark rich red that we obtain in the burning.

President Purington: We have brick like these in the Western market, but we do not call them Harvard brick.

Mr. Hunt: This term Harvard is very misleading and as Mr. Fish has been very candid in giving us the term he gives to brick in shipping them to the unsophisticated Westerners we appreciate it very much. We in the West employ that term not because we understand it indicates the character of the brick, but it adds a commercial value. There is a difference in presenting a brick of that character to an architect or an owner of a building, as a water struck or Harvard brick—the term Harvard adds a commercial value. (Laughter.)

Mr. Talbott: If I may be permitted to refer to the fire brick question again, I have an exhibit of fire brick out here in the exhibition hall, including a dry press brick, a brick made of plastic and flint clay, one made entirely of flint clay and also a stiff mud brick. If the gentlemen would like to see these brick after adjournment, I would be very glad to show them to them.

Secretary Randall: This finishes the regular programme. I would say we have made this morning's programme short for the purpose of giving the members a chance for lobby talks, a feature which is really as important a part of the Convention work as the sessions themselves.

President Purington: Before we adjourn I will appoint the following members as a Committee on Resolutions: Geo. H. Shellenberger, St. Paul, Minn.; Edw. B. Fish, Rochester, N. H.; Albert Klein, Baltimore, Md.; A. M. Smith, Portland, Ore.; Lemon Parker, St. Louis, Mo.; Wm. Sutton, Table Rock, Neb.; T. L. Herbert, Nashville, Tenn. I would suggest that the Committee meet up here at the platform immediately after adjournment.

On motion of Mr. Hunt the meeting adjourned.

THIRD SESSION,

Thursday Afternoon, February 4, 1904.

President Purington: Convention will come to order and we will take up the regular Thursday afternoon programme. I will ask Secretary Randall to announce the first in order.

Secretary Randall: Mr. Gunn, who is first on the programme, telephones that he cannot possibly be with us this afternoon, so we will have to skip that for the present. This brings us to a paper by Prof. Ira O. Baker of Champaign, Ill., on "Neglected Details in Brick Pavement Construction." I will say in behalf of Prof. Baker that it was my suggestion that the paper be illustrated with stereopticon views, and he intended to prepare plates for same, but afterwards found that he was unable to do so, but I know his paper will interest you just the same.

NEGLECTED DETAILS IN BRICK PAVEMENT CONSTRUCTION.

By Ira O. Baker, C. E., D. Eng'g, Professor of Civil Engineering, University of Illinois, and author of "A Treatise on Roads and Pavements," Champaign.

Gentlemen of the Convention:

When the Secretary of this Association asked me to present a paper at this Convention I objected on the ground that I had nothing to say that would be either interesting or of advantage. He explained that the members of the Association held that they promoted the private interests of paving brick manufacturers to the best advantage when they were helping to educate the public as to the best and most economical methods of constructing brick pavements, and that I was desired to present a paper calling attention to any points which I thought would improve the quality or reduce the cost of ordinary brick pavements. The writer freely admits that some of the most important advances in brick pavement construction have been the results of investigations conducted by this Association and of papers read at its annual conventions, and the writer also freely admits that the benefits of these investigations and of these papers have been greatly enhanced by the liberality of this Association in disseminating this information. Therefore the writer is very glad to contribute his mite toward the improvement of brick pavement construction, particularly since a brick pavement possesses many of the most important requisites of an ideal pavement.

The outline of the method of constructing a brick pavement is so generally understood as to make it unnecessary in this paper to give a description of the several operations, and therefore attention will be centered upon those parts of the work that seem to have received the least attention, or at least seem most to need attention. The subjects to be considered will be taken up approximately in the order in which they occur in the work of construction.

—Width of Pavement—

In many cases a considerable part of the money spent for a pavement is wasted by making the pavement wider than is necessary. A narrow pavement not only costs less to construct, but also costs less to clean and sprinkle. Of course, except for the cost, the wider the pavement the better; but length is more desirable than width. An excessive width is a needless expense and delays or wholly prevents the getting of any pavement at all; and hence one help towards securing pavements is to make them only wide enough to accommodate the traffic.

It is not unusual to find residence streets in small cities, without street car tracks, with pavements 36 to 40 feet wide. The only travel over such streets consists of private carriages and the delivery wagons that supply goods of various kinds to the residents. All the pavement that such streets really require is a width such that two vehicles may pass at reasonable speed and with ordinary care without interference. A width of 18 feet affords sufficient room for a vehicle to pass when another is standing on each side of the pavement—a rare occurrence—and therefore appears that a pavement 18 feet wide, or at most 20 feet, is sufficient for the less frequented residence streets. Therefore any money spent to construct a wider pavement is not only absolutely thrown away, but the cost of sprinkling and sweeping is also needlessly increased. Further, narrowing the pavement increases the lawn space, which not only improves the appearance of the street, but also gives additional space in which to place gas pipes, water pipes, etc., and thereby prevent the tearing up of the pavement, which is always a damage. The only objection to a very narrow pavement is the difficulty of turning a team on it. The seriousness of this objection depends upon the construction of the vehicle. Many delivery wagons, express wagons, etc., may be turned easily on an 18-foot pavement. If occasionally a vehicle is compelled to go to the corner to turn, or even to drive around the block, the inconvenience is not very serious, and is so infrequent as not to justify any considerable expense to prevent it. If the block is long, or if the objection to some vehicles being compelled to drive around the block is considered important, then it is much cheaper to construct a turning place near the center of the block than to build an additional strip of pavement the entire length.

The cost of pavement, per square yard, is practically independent of

J. P. CALHOUN, Murray, Utah.

its width, and therefore the reduction of the width of the pavement on residence streets from 36 or 40 feet to 18 or 20 feet will save nearly 50 per cent. of the cost, and if the cost can be reduced one-half, the number of paved streets will be increased much more than proportionally.

It is not wise to take time to discuss the width of pavements on residence streets containing car tracks, nor on business streets, but a little investigation will show that in many cases the pavement is considerably wider than has been found entirely satisfactory under similar conditions. The views here express not mere theory, but are supported by experience in a number of cities. In recent years there has been a marked tendency, in the middle West at least, to reduce the width of pavements on residence streets and on business streets in the smaller cities. Attention is here called to the matter because far too often the width of the pavement is made a fixed proportion of the total width of the street regardless of the real needs of travel. This is only one of the many ways in which many municipalities suffer from the lack of more competent engineering service—the loss frequently being many times the saving.

—The Subgrade—

It is unnecessary to say that the subgrade is the ultimate support of any pavement, and that both the cost and the efficiency of a pavement depends upon the supporting power of the soil upon which it rests. There are only two ways of increasing or supplementing the supporting power of the subgrade: (1) by underdrainage, or (2) by constructing a pavement that will distribute the concentrated load of the wheel over a considerable area of the subgrade. Usually the former is both the cheaper and the more effective. Tile drainage is cheap to construct, is certain in action, and costs nothing for maintenance. With all soils, except clean dry sand, the cost of both the construction and the maintenance of the pavement could be materially decreased by proper underdrainage.

Prof. Ira O. Baker, Champaign, Ill.

Not only should the subgrade be properly drained, but it should be thoroughly rolled to compact the surface and also to reveal any soft spots. Usually just before a pavement is to be constructed, the street is dug up to lay sewers, and water and gas pipes and to connect these with the private property; and almost universally the trenches are refilled in such a manner that great care and skill are required to construct a pavement which will not ultimately settle over the trenches, much to the damage of the pavement and the disfigurement of the street. It is always specified that the subgrade shall be thoroughly rolled; but it needs only a casual inspection of the pavements of any city to show that this is seldom done in a manner to prevent settlement, is to properly refill the trenches; but usually this is indifferently done, owing to the ignorance or the carelessness of the proper municipal officer, and as a consequence the remedy of this defect is left to the paving contractor. The subgrade should be rolled both longitudinally and transversely with a steam roller weighing not less than five tons. If the street is rolled in only one direction, only one set of trenches will be compacted. The subgrade can not be rolled transversely with a horse roller; and besides the horses' feet tear up the subgrade nearly as much as the roller compacts it, particularly when the rolling is almost completed. The roller should pass over the surface several times to settle the filling into the trenches and also to compact the surface by the kneading action of many passes of the roller. Unfortunately the specification requiring the use of a steam roller adds somewhat to the cost of a pavement, since that implement is expensive in first cost and also in maintenance, and since ordinarily it can be used only a comparatively short time each year; but its use is believed to be worth its cost, particularly if the trenches were not properly back-filled.

—The Foundation—

Brick Foundation. The first brick pavements were laid on a foundation consisting of a layer of gravel and a course of brick laid flatwise. This form of foundation has been all but abandoned for two reasons: First, because some other form is usually cheaper; and second, because of the lack in the past of proper precautions in laying the foundation. There have been two defects in constructing this form of foundation. First, the gravel is neither spread nor consolidated uniformly. This point will be considered fully later. The second defect consists in laying broken bricks with their broadest side up, and hence the space below is not well filled while the cushion coat is being spread, and consequently after the pavement is completed the cushion coat works into these cavities and permits the surface of the pavement to sink. If all broken brick are laid on the broad side and care were taken thoroughly to fill the joints while laying the cushion coat, this form of foundation will give satisfaction, even though the lower course of brick be quite inferior. The writer is quite familiar with a piece of such pavement laid on a very unfavorable subgrade, but with proper precautions in the two respects mentioned above, which for ten or fifteen years has given entire satisfaction and has as good a surface as adjoining pavements on a concrete base, even though the latter are on a more favorable subgrade and carry less travel. This pavement illustrates a rule of construction that cannot be repeated too often, viz: No good brick pavement can be constructed without proper attention to all details.

Concrete Foundation. Nowadays it seems to be the general belief that a 6-inch concrete base is necessary for a brick pavement; at least the foundation is used indiscriminately for business and residence streets, and is used indiscriminately also on the stiffest soil and on the softest. A 6-inch concrete foundation is ordinarily used under an asphalt pavement, which is a more or less flexible layer from 2 to 3½ inches thick; while the same thickness of concrete is ordinarily used with a brick pavement having a cement filler, which is a very rigid layer from 5 to 7 inches thick. Is there any evidence that the foundations of asphalt pavements are generally weak?

An engineering journal recently contained an account of a test of the supporting power of an asphalt pavement, made by hauling over it a truck weighing 22,300 pounds and giving a pressure of slightly over three tons on two wheels having tires four inches wide. The foundation consisted of a 4-inch layer of natural-cement concrete mixed in the proportion of one part cement, two parts sand, and five parts crushed stone. The asphalt wearing surface was two inches thick. The subgrade consisted of "soft wet clay which had been much disturbed by many trenches for sewers and for water and gas pipes." The pavement had been in use twelve years when tested, and had shown no signs of failure. "The above load was hauled over this pavement from end to end and produced no effect upon the pavement except to make a slight depression in the asphalt where the wheels stood for half an hour, the day being warm."

Does this prove that the concrete foundations of brick pavements are generally needlessly thick? Surely if four inches of concrete over soft clay and under a 2-inch asphalt wearing-coat can support such loads, the six inches of concrete is surely needless under brick pavement with cement filler.

Let us consider this question from another point of view. There are three and only three reasons for constructing a pavement, viz: (1) to secure a smooth surface for ease of cleaning and to decrease tractive resistance; (2) to secure an impervious roof to prevent rain water from softening the subgrade; and (3) to interpose a layer that shall distribute the concentrated load of the wheel over so great an area of the subgrade that it can safely support the load with depression. For the moment, we are not concerned about the smoothness of the surface, and hence nothing will be said here about the first reason for constructing a pavement. The wearing surface of a brick pavement is practically impervious whether sand or cement filler be used, and consequently a concrete foundation is not necessary to secure a water-tight roof to protect the subgrade. Therefore, the concrete foundation of a brick pavement acts only to distribute the load of the wheel over the subgrade. The concrete distributes the load by virtue of its ability to act as a beam; and this property is due to the cement which the concrete contains. If there were no cement in the concrete, the layer of gravel or crushed stone would distribute the concentrated load of the wheel over a considerable area. The pressure of the wheel is transmitted downward in diverging lines; and if the point of contact of the wheel is considered as the apex of a cone having its base on the subgrade, it may be assumed that the load of the wheel is distributed nearly uniformly over the base of this cone. It is unwise to attempt here to go into the mathematics of the subject further, but the efficiency of a layer of broken stone in distributing a concentrated load is proved by the fact that, under favorable circumstances as to soil and drainage, 4 inches of broken stone has successfully carried considerable traffic, while 6-inch macadam roads are quite common in a number of States. If 4 or 6 inches of macadam without any other pavement will carry the traffic, the same thickness will certainly make a good foundation for a brick pavement under ordinary conditions—particularly if a cement filler is used, since the filler gives the course of brick a considerable transverse strength, as will be discussed later. The writer recently saw a piece of brick pavement with sand filler which is laid directly upon the black loam of the Illinois corn belt which for six or eight years has carried the heaviest travel of a city of three or four thousand inhabitants and which is still in good condition. A tile drain was laid at each side of the street, the subgrade was well rolled, and the paving bricks (not blocks) were laid upon a layer of sand and small gravel only one or two inches thick. Probably no small part of the success of this pavement is due to the fact that a prominent and intelligent and successful local business man acted as inspector. The writer does not advocate the general adoption of this form of construction; but cites this case to show what can be done by intelligence and care, and prove that a layer of concrete is not always necessary. A needlessly expensive form of construction is not only money wasted, but deters the construction of other pavements.

Not infrequently pavements having a concrete foundation are found which have settled over trenches. Does not this prove that the ordinary concrete foundation is not strong enough? No, it simply proves that the foundation over the trench is not strong enough. There are two remedies for this condition of affairs. Either consolidate the filling in the trench better by rolling or tamping as described above; or make the concrete thicker over the trench. The first is cheaper and more scientific. In no case is it justifiable to thicken or strengthen the foundation over the entire street simply because trenches ocupying from 5 to 10 per cent. of its surface may not have been properly back-filled.

Before considering substitutes for concrete foundations, let us examine the concrete a little further. Formerly it was the custom to use a rich natural cement concrete, because it was cheaper than a Portland cement concrete of equal strength. A few years ago nearly all the Portland cement used in the country was imported, while now nearly all of it is of domestic manufacture; and further it is not only home-made, but it is both better and cheaper. Although natural cement is marvelously cheap, a concrete of a given strength can be made cheaper of Portland than of natural cement. Experiments made at the University of Illinois show that a concrete composed of one part Portland cement, eight parts of coarse sand or fine gravel, and eight parts of screened or broken stone was considerably stronger in compression and also in bending as a concrete composed of one part natural cement, three parts of the same sand, and three parts of the same broken stone. These proportions have been practically tested in the construction of half a mile of pavement the past summer with the greatest satisfaction to all parties concerned. Prices vary greatly with the locality, but in most, if not at all, cases Portland cement concrete is cheaper in proportion to strength than that made with natural cement.

Before dropping the subject of concrete foundations, a few words should be said in condemnation of the quite general practice of leaving the upper face of the concrete needlessly rough and irregular, with loose stones strewn over the surface. To secure a uniform surface for the pavement, the cushion coat should be of uniform thickness, and hence the top face of the concrete should practically be parallel with the surface of the finished pavement. Also any loose stones on top of the concrete causes the brick to be broken during the rolling and produces inequalities in the surface of the finished pavement. Both of these effects can be eliminated without appreciable expense by a little care.

Finally, although brick pavements are usually laid upon concrete foundations, it by no means follows that a concrete base is either necessary or most economical. A course of gravel or broken stone, when properly laid, will make as good a foundation as a layer of concrete, and in some cases is cheaper. Further, less skill is required with a gravel or broken stone foundation than with a concrete foundation. Those who have made cuts into concrete pavement foundations report that in a majority of cases the concrete is no better than a layer of broken stone without cement, due apparently to carelessness, or inefficiency, or dishonesty in the construction. The process of placing gravel or broken stone is simpler, and therefore there is less danger of inferior work; and the gravel or broken stone requires less hand labor, which is an advantage to contractors in these days of inconsiderate demands of laboring men. As to whether concrete, gravel, or broken stone should be used for the foundation in any particular case depends upon local prices and the local conditions; and right here is where the city needs engineering advice of a high order, for a single word in the specifications may add hundreds of dollars to the cost of the work without any return. It is more scientific and usually more profitable to give time to the consideration of the specifications than to higgling with the contractor.

Now a few words, only a few, about foundations that may be substituted for concrete.

Gravel Foundation. A gravel foundation for a pavement is constructed substantially as a gravel road. It is customary to dump the gravel upon the subgrade directly from wagons, and then to level off between the piles with shovels. By this process the lower part of the original piles is much more compact than the space between the piles; and rolling does not materially lessen the inequalities, since the roller, being a cylinder of considerable length rides upon the top of the piles and does not compress the gravel between them. The result is that soon after the pavement is completed the natural settlement of the gravel foundation causes the surface to be full of depressions. The better and cheaper method is to level off the piles with a scraping road-grader, and then thoroughly harrow the gravel with a long toothed harrow, after which the foundation should be rolled. For the best results, the gravel should be spread in layers not more than three or four inches thick. Brick pavements upon gravel foundations laid by this method have shown no depressions after many years, while those constructed with the utmost care by the preceding method with the same gravel on the same soil have been full of holes. This is another example showing that cheaper materials and proper methods intelligently applied give better results than expensive materials improperly used.

Broken-Stone Foundation. A broken-stone foundation may be constructed somewhat as a macadam road. If the rock is soft or contains much fine material as it comes from the crusher, it should be screened to take out all the dust and most of the pieces up to say ¼-inch in greatest dimensions. The broken stone may be hauled to the street in wagons, and dumped upon the subgrade. It may be spread by hand with forks or rakes, or it may be spread with a scraping road-grader, the latter method being the cheaper. In spreading the stone care should be taken that the several sizes are not separated too much, and that the piles on which the stone was dumped from the wagons are not left too high. The layer of stone should be rolled until the individual stones do not move as one walks over the surface, or until the surface stones are not easily kicked out with the feet. After the completion of the rolling, the surface of the broken stone should be impervious to the sand to be used in the cushion coat. With most stone this condition will be secured by the crushing of the top layer of the broken stone during the rolling; but if there are spots that are porous, throw on a few shovelsful of fine stone and roll again. If the stone is hard, it may be necessary after the rolling is nearly completed to apply a thin coat of finer or softer stone. Of course the top of the foundation should finally be left smooth and of proper grade and crown.

Carl E. A. Trommer, New York City.

The rolling required with either a gravel or broken-stone foundation can best be done with a steam roller, which is only an additional reason for specifying that the subgrade shall be rolled with a steam roller. Although it is a little out of place here, this is the most convenient place to say that a steam roller is also much better than a horse roller for rolling brick. If the subgrade, and the gravel or broken-stone foundation, and the brick are all rolled with a steam roller, the cost of rolling any one of these is materially lessened, since the roller is thus used a greater part of the time.

—The Cushion—

Little need be said about the cushion coat. The sand for the cushion should be, and usually is, fine; and therefore it is desirable that it should be uniformly dry, since a very small per cent. of water increases the volume of fine sand to a surprising degree, and consequently when the wet spots dry out the pavement will show a depression.

It is generaly conceded that the cushion coat can be surfaced best by drawing over it a template reaching from curb to curb or from curb to a screed bedded in the middle of the street. Some contractors use a hand lute run upon screeds bedded comparatively close together; but this method does not give as good results as the longer template, owing to the difficulty of properly bedding so many screeds.

—The Brick—

Largely through this Association the standard of paving brick is nearly all that can be desired; and through the efforts of the individual members of the Association good paving brick can be had in nearly all localities at reasonable prices. The writer firmly believes that the manufacture of paving brick is conducted with greater skill and has reached a higher degree of success than any other part of the work connected with the construction of a brick pavement. Doubtless there will always be need to exercise care in selecting brick of uniform quality, but that need is steadily growing less year by year.

However, there are two particulars in which the writer believes that the practice of some brick manufacturers could be changed with advantage to the pavement. One of these is the rounding of the corners. It is possible that the rounding of the corner was introduced in part at least to decrease the loss while being tested in the rattler, but the round corner surely makes the pavement rougher. It is a disadvantage also in that it gives a thin edge to the joint filling, which causes it to crumble and chip off. The round corner is more objectionable with a cement than with a sand filler.

Some paving bricks have grooves in the flat side, apparently to give the joint filler a better hold. Obviously such grooves can be of no advantage with a sand filler, and some experiments to be referred to presently seem to indicate that they are not necessary with a cement filler. The grooves may give the filler a little freer entrance to the joint, but this effect is not great and is not needed; while the virtually wider joint is a disadvantage. But the chief objection to the grooves, particularly when they run lengthwise of the brick, is that they cause the brick to spall off from the top surface down to the groove, probably owing to the blows of the toe and heel calks of the horses' shoes. In all the grooved brick that the writer has seen this is a serious defect.

—The Joint Filler—

Cement grout is the best material with which to fill the joints, and the report of this Association as to the method of applying this filler leaves nothing more to be said on that subject.

It has long been recognized that the chief advantages of a cement filler was that it protected the edges of the brick from spalling off; but there is another advantage that is not so generally recognized. Experiments conducted at the University of Illinois show that if a Portland cement filler is applied in the manner specified by the committee of this Association, the layer of brick becomes a beam with approximately the same resistance to bending as a 6-inch layer of the natural cement concrete ordinarily used in a pavement foundation.

F. H. Eggers, Cleveland, Ohio.

The fact that the cement filler adds greatly to the rigidity of the layer of brick does not rest alone upon a single series of experiments. It is well known that the expansion of a brick pavement with a cement filler causes it to be lifted up from the foundation, as is proved by the rumbling sound produced by a loaded wagon going over the pavement. A little investigation will show any one that the brick can not act as a true arch, but that the layer must bend under the load and touch the foundation at certain points. That the layer of bricks will thus act proves that it has a considerable resistance to bending, i. e., that it acts as a beam as well as an arch, or more properly, that the layer of brick with a cement filler acts as an elastic arch.

This fact shows that the use of the cement filler adds as much rigidity to the pavement as does the ordinary concrete foundation; and shows also that if a certain foundation is strong enough with a sand filler, it is substantially twice as strong with a Portland cement filler. Again, if a brick pavement having a sand filler and a 6 inch concrete foundation is sufficiently strong to carry the travel, a pavement with concrete filler and a 6-inch foundation of broken stone without any cement will also carry the travel.

A little computation will show that the cost of the cement filler is about the same as that of the cement in the usual concrete foundation. Therefore, it would apparently be better economy to employ the cement in the joint filler than in the concrete foundation, since in the former case the cement gives rigidity and also protects the edges of the bricks from chipping, while the cement used in the foundation gives only rigidity. The practice of using concrete foundation and cement filler with a brick pavement has gradually grown up without any careful consideration of the fundamental principles involved. The reason is not difficult to find.

In the first place city governments far too often select as city engineer a local man acceptable to the dominant party, or to the controlling element in the party, without much regard to his fitness to plan and execute large public improvements with economy and efficiency; and as before remarked, his incapacity to grasp the fundamental principles may cost the municipality in a single improvement many times the annual salary of a really competent engineer. In the second place, it is too much the custom for one city to copy the pavement of another without due regard to the difference in conditions, and last, but not least, pavements are generally designed by engineers working upon a salary without the stimulus of individual financial interest or of competition; and hence this branch of engineering is much behind others in point of economy and efficiency. Most of you have doubtless read how American bridge engineering absolutely leads, yea even outdistances the world in India, in Australia, in South Africa, and in Egypt. American bridge building has reached this degree of excellence through the application of the principle of competition in design and manufacture. European countries have long had abundance of competition in manufacture, but have not reached even a fair degree of excellence in bridge building; for when the bridge is designed its cost and efficiency is already fixed within narrow limits. In this country, we have competition in the manufacture of pavements, but none in their design; and hence in the matter of pavements most of our cities are comparable to European countries in bridge building. American practice in pavement construction will not be greatly improved until municipalities demand a higher order of engineering ability. The writer does not want to be understood as saying that there are no really competent city engineers, for there are many such; but he does claim that there are far too many who lack the thoroughness of knowledge and the breadth of view to effectively and economically conserve the best interests of the municipality in the construction and the maintenance of its pavements. But a discussion of this question would lead us too far afield.

In conclusion, permit a brief summary. Attention has been called to the width of pavements, in which it is believed that the construction of all forms of pavements may be greatly cheapened without materially decreasing their usefulness. Attention has been called to several matters wherein the efficiency of a brick pavement may be greatly increased without much increase in its cost. Again, attention has been called to a few particulars in which the cost of a brick pavement may be considerably decreased without in any way decreasing its usefulness or efficiency.

If the members of this Association approve any of these points, it is hoped that they will use their influence in securing the changes proposed; and it is believed that by so doing they will thereby aid in the general advance of municipal life, and at the same time materially increase the demand for brick pavements—a form of pavement admirably adapted to many of the streets of the great cities and the only high-class pavement available for the most of the smaller cities. (Applause.)

Brick Pavements—General Discussion.

C. C. Barr, Streator, Ill.: Mr. President—I move a vote of thanks be extended to Prof. Baker for the very excellent paper on brick pavements.

Motion seconded and carried unanimously.

Prof. Baker: Gentlemen, I feel myself highly honored.

Mr. O. N. Townsend, Zanesville, O.: I would like to make one comemnt on this paper that is of interest to the public, that is in regard to a four-inch concrete base. I have always felt being a contractor as well as a manufacturer, that four inches is all that is necessary instead of six, and the paper has demonstrated that such is the case. I think we should use our influence to draw up specifications for a four-inch base, and a Portland cement filler. I would also like to state that a less rounding of the corners is also advantageous.

President Purington: We have with us Mr. W. S. Brennan, one of the Commissioners of Public Works of Chicago, from whom we would be pleased to hear..

W. S. Brennan, Chicago: Mr. Chairman and Gentlemen of the Convention.—I have heard more of the details of brick pavements since I came into the hall than I kenw before I came here. I came here on the invitation of Mr. Christopher, and before saying anything on the paper, I want to say that I was so favorably impressed with the method of registering the members of the Association and those who are received as guests, placing in their coat lapel a button with a number and issuing a bulletin each day or twice a day, with the name and number of each member of the Association, that I gladly paid my five dollars and became a member of the Association, although in making out the application I could not fill out the latter part—I could not state what kind of brick I made. (Applause.) In our city, and I can only discuss paving as I know it as an observer in the city of Chicago, I have served as Commissioner for a number of years, and as an alderman was much interested in paving. The matter of paving is almost entirely taken out of the hands of the Commissioners of Public Works, and placed in the hands of the Board of Local Improvements. They pass upon specifications and also upon the work. Their inspectors handle the whole thing and the Commissioner of Public Works turns it over to the Board of Local Improvements. Then when the inspection is finished turn it back to the Commissioner of Public Works. That part of the paper which referred to the lack of the ability of city engineers, etc., struck me very forcibly. In cities which were incorporated under the Board of Local Improvement Law, which is in force in the State of Illinois, the engineer has very little to say about the conduct of affairs of the Board of Local Improvement, and the Board of Local Improvement is appointed by the Mayor, and sometimes the Mayor knows a friend or discovers an honest man, who is not a politician, perhaps a very good man, entirely ignorant of what these specifications mean, and they drift along from day to day, with the most convenient way of handling all matters which they are called upon to take charge of, just as easily as they can for their own benefit, without going into too much argument to technical difficulties. Possibly some slick promoter gets into the home of the taxpayer and gets their consent to sign a petition for a pavement and they never know anything about the material that is selected. This is the condition that prevails in many towns and it is an unfortunate one. In listening to this paper the thought occurred to me that this Association should not keep this paper to themselves, but should have it scattered broadcast over the country. You can all say what you please, but you have got to advertise. You have got to let your goods be known. You have got to let the people know what the best thing is, and if it is true that a four-inch crushed stone foundation is good enough to put the brick on with a cement filler and produce a first-class pavement, it means a great reduction in the price of a first class pavement. It means the popularity of brick pavement over asphalt. In our city we have what is known as a ten year guarantee. I understand that 75 cents per yard is added to the price of asphalt for the purpose of taking care of the guarantee, so the citizen pays 7½ cents per yard in advance. Count up the interest and you see what they pay. Now it is a question whether they ever get value for their 75 cents. Just as soon as a corporation as strong as the asphalt company find out they have the best of you, they show their hand and say, "Go on with your guarantee, and see where you get off." There is no question in my mind but that there are only two permanent pavements—granite block and brick. You all know that granite is the most durable pavement made, yet its expense precludes its use on the various streets in our city. Our city is peculiar in one respect. You have here in Cincinnati, a city where you have five mules hauling what one team will haul in the city of Chicago. The result is that the wear and tear on the pavements of the city of Chicago, as two would be compared to five. In fact two horses or mules will pull in Chicago what you would need five for here in Cincinnati. So a pavement must be designed to take care of that traffic, and of course the load falls on the taxpayers. You gentlemen in the Association must be the means of advancement that will help the taxpayer out. You have experience and you meet year after year, and if you don't do anything else but meet in pairs and couples and groups and compare ideas, you are bound to receive the benefits of this Association, to receive the benefits of the experiences of the men from all over these United States, and the result is that you are better informed on this proposition than any single man in any single city in the United States can be. I recently picked up the specifications that are used in Terre Haute and read them very carefully. I consider them very excellent specifications. In many cases ignorance is the cause of not having better pavements. There are some cases where wisdom is the cause. (Laughter.) I mean that sometimes some particular official is extremely wise and knows how to make it benefit some particular pavement, but I consider that the exception, not the rule. So far as I am personally concerned, I suppose it is due to the atmosphere and surroundings and my associations, I believe that a brick pavement is the best pavement and I believe this Association should send that paper of Prof. Baker's broadcast throughout the country, and see that a sufficient number of the pamphlets are sent to the taxpayers that they may see what a good pavement is. There is no reason why under the present system in our city, the people cannot insist upon anything they want. All they have to do is to know that the thing is right and then insist upon having it done, and no engineer will dare to stop it. It is the only thing you can hope for. It is the only way you can hope to have a pavement that will be a credit to the brick men and put the asphalt trust out of the business. (Applause.)

J. W. Robb, Clinton, Ind.: Mr. Barr moved a vote of thanks to Mr. Baker. The gentleman who has just spoken has suggested that the paper be printed in pamphlet form. I move that the paper be printed in pamphlet form, and that the paving brick interests of this Association bear the expense. If this is done, my company will take 500 copies.

W. W. Winslow, Indianapolis, Indiana.

W. W. Winslow, Indianapolis, Ind.: I second the motion.

Carried.

Mr. Ittner: I do not care to discuss this paper, but there is one thing in connection with the paper that suggests itself to me and I will throw it out here. It will do no harm. I believe that the speaker recommends a two-inch sand cushion. Now a two-inch sand cushion where a cement filler is used I think may be all right, but a two-inch sand cushion where a sand filler is used I think would be too great. I think a great concentration of weight occurs when a heavily loaded team with a two-inch or a two and a half inch tire passes over the street, there would be a displacement of sand. I simply make this suggestion. I have from time to time in our Conventions had something to say on the subject of vitrified paving brick, although I am in no way interested in the manufacture of them. I think where there is a sand filler, two-inch cushion of sand would be too great and would give an opportunity for displacement and cause little ridges to occur in the street as has happened in the city of St. Louis. I have seen this in our city where a wagon would go along with one wheel in the street car track quite a distance until driven out by a passing car, and you can see where the opposite wheels were, by a little rut running along in the street, a depression of a quarter and sometimes half of an inch.

Mr. W. P. Blair: I would like to ask Mr. Ittner where conditions of that kind prevail; was there proper compaction during the process of construction.

Mr. Ittner: That is a question I cannot answer because I amnot engaged in the business, and I do not watch it close enough. I am telling about conditions I see. I observe street pavements of all kinds, and a brick street I observe more than any other kind. I believe a properly made brick pavement is the coming pavement for this country, and I believe it as strenuously as ever I believed anything in my life, and I think it should be impressed on the people of this country, and the sooner we do this the sooner we will reach the ideal pavement. (Applause.)

Mr. Purington: I want to set Mr. Ittner straight. I do not believe that if the concrete foundation of the street is put down properly that those ruts will never be seen on any street. Never,

Mr. Ittner: The point I want to make is that it will not if concrete is used.

D. V. Purington: If Mr. Ittner had sweat blood in the city of Chicago as I have over the specifications permitting but one inch of sand cushion, he would feel a great deal as I do when a suggestion is made that means two inches, especially for the kind of a foundation we get. Prof. Baker made a reference to concrete foundation and to the small stones that are frequently left. I think those of you who are at all familiar with the appearance of a concrete foundation of a street after it is prepared for the sand cushion, will recall that there are little knobs all over it and these vary in extent from a quarter of an inch below the grade to an inch above. Now with a one-inch cushion of sand on a street prepared that way, the chances are that one-half of the brick are resting on these projections from the concrete foundation, and I believe it has been universally conceded by those who have given it a study that not less than two inches of sand should be allowed for a sand cushion. It is impossible with less than that to get the brick sufficiently above the foundation so they will not hit it. Another objection is the resonance that comes from the brick by the contact with the concrete. There is no question about it that two inches of sand cushion to keep the brick entirely free from the foundation or from these knobs lessens the noise. This, you all know, is the greatest objection that is raised to a brick pavement. I have found very few contractors who did not think two inches of sand was necessary. The authorities of Chicago have become convinced and have changed their specifications to two inches of sand as a minimum. I do not think this paper of Prof. Baker's could be discussed very much by any of us, but there is one little point that touched me. There is a vein of selfishness in all of us. He says he wants the pavements narrow and long. I say we want them wide and long. (Laughter.) I think I voice the sentiments of every brickmaker here. One of the great objections to brick pavements, and the same holds true of asphalt pavements, as I have seen them in Chicago, is the filling of these ditches alluded to by Prof. Baker, not only the ditches that have been filled in prior to the laying of the foundation or grade surfaces, but also the cutting through of the concrete after the street has been completed. I think in one block in the city of Chicago the brick pavement has been opened sixteen times, cut through the concrete until really there is nothing left of it but holes. You all know what it means to cut through concrete and dig it up. The concrete stands where it is and the dirt drops away from it, and if any of you have tried, you know what a job it is to pack up under it. I do not know of any better illustration to my mind than one street or one block in Chicago that has been down for nine years and has never been touched from the time it was put down. There has not been any repair on it, while the other block diagonally across the block near Washington and Lasalle, it has been opened twenty times or more and it is uneven and all worn out; there is no difference in the quality of the brick, no difference in the construction of the pavement. One has gone to demnition bowwows and the other is as perfect as when put down. There is one little condition that prevails in Chicago that Mr. Brennan has evidently never heard of. He alludes to only two kinds of filler, sand and cement. We have what is known as a tar filler in Chicago, and we put it in at a greater expense than we would cement filler and after about the first hot spell after the brick were put down, from the interstices between the brick, the tar filler ran clear across the street, there being some curve in the street and the gutter contained all the filler.

Wm. Conway, Philadelphia, Pa.

W. P. Blair: That was a tar street with a brick filler. (Laughter.)

Mr. Purington: I think the Board of Local Improvements in Chicago are beginning to get their eyes open. I would a great deal rather have a sand filler than a tar filler. There was a street put down in Chicago some eighteen years ago of Ottawa brick, 12x4x5, and some of them were taken up some time ago and were as good as when put down. The first brick pavement put down since I have had anything to do with brick pavements was a two-course pavement, one course on the flat and one on edge. That was put down in the spring of 1893, two blocks on Lake Avenue, from 35th to 37th. There has not been a cent of repair or any changes made in the street and the brick are as good as when put down. They were put on sand. I do not think I could say the same thing if they had been on a clay subsoil. That is one reason why I do not believe that any set of specifications can be made that will fit all the existing conditions, and that is where engineers fail. Possibly some engineer in a flat prairie town would see that pavement, and would want to put down the same thing, and it would be practically a failure, especially if he did not get his drainage right. I think the same remark applies to Prof. Baker's criticisms, if they might be so called, on engineers. A set of specifications for a heavy business street in a large city must necessarily require much better work, and I think a heavier foundation than in small towns. I think that goes without saying. Yet, a set of specifications adopted by some well known engineer of good standing is likely to be adopted by a small town bound to follow in his footsteps. This is one of the things we must educate the people to see the foolishness of. There is so little in that paper to criticise and so much to praise that I think when Mr. Randall gets out his pamphlet and notifies the paving brick manufacturers what the bill is, there will be little doubt but that it will be settled 50 cents on the dollar at any rate. (Laughter and applause.)

W. P. Blair: I am convinced in my own mind that the greatest trouble of the paving brick manufacturer is that we are too modest.

Mr. Ittner: Of course, you do not refer to Mr. Purington. (Laughter.)

Mr. Blair: It is a fact generally admitted by our competitors. Even the asphalt people say we make a good brick, that it is probably a fact that it will last a long time, but that it soon becomes a rough, unsatisfactory, cobblestone surface over which you can not ride for pleasure. We have made brick, all of us, and we have made them right, and for the past three or four years we have circulated throughout this country, from one end to the other, a set of specifications to which no man can take exceptions, unless with a view in his mind of cheapening the street. I watched closely Prof. Baker's paper from beginning to end and I do not think I can take exception to one single thing in it, but we must have a little more skill in carrying out these specifications. If Prof. Baker were to stand over or oversee the construction of a brick street I doubt not it would be right and last a long time, a great number of years, even if it had no foundation under it at all. The cross-breaking strength of a vitrified brick in size 2½x4x8¾ is over 30,000 pounds, and it don't need a foundation. I know myself that one of the best brick streets in our town was constructed with the ditches unfilled or depressed as described by Prof. Baker, and it stands there today with but one broken point from one end of the street to the other, and that broken place is not over three feet in diameter. The strength of the brick street, or arch or beam, as Prof. Baker describes it has held that street up, and there passes over it 3,000 to 5,000 teams every day of ten hours, and has for over thirteen years. In his book on Roads and Pavements, you will find that Prof. Baker says the wear on that pavement is almost imperceptible, it does not exceed from 1-32 to 1-64 of an inch in thirteen years, and in a few places there is no foundation under it of any character. I have here a little specimen of brick street that has been down in the street under heavy traffic for eight years before it was taken out. The brick are of the cheapest kind we manufacture, plain, wire-cut and ordinary size brick, filled with cement. The wear on that street is imperceptible. It has not yet been down long enough to show any wear, and probably will not show any for seven or eight years to come. I want to allude to the guarantee clause of which Mr. Brennan spoke. I care not what the traffic is, build the streets right, following out the specifications as laid down in Prof. Baker's paper, and you will not ask a guarantee from any brick street contractor or manufacturer. We have town after town where we get construction like that that have eliminated from the brick people all idea of a guarantee for the maintenance of a brick street. Brick street constructed after the specifications given in that paper out of any one of fifty different brick made in this country, will last on any street in Chicago fifty years. I care not what the town, nor the size. I must take exception to Mr. Brennan's remarks about a granite street. We do not know that the granite street is the best street, nor is it the most durable. (Applause.) The cross-breaking strength of a vitrified brick is 4,000 pounds, and the best piece of granite of like size you can get in this country is but 2,900 pounds. I mean the cross-breaking strength. That is by a sharp angle resting under the brick one-half inch from the end, as they are tested in St. Louis, and a like angle underneath the opposite end, and have a knife coming down in the center and on top. A great majority of these brick will stand 5,000 pounds, and you know granite will not stand much more than half that.

A Member: What is the crushing strength?

Mr. Blair: It is about as two to one in favor of the brick. (Applause.) There is one other point in regard to these granite block. I favor the organization known in this country as the Society for the Prevention of Cruelty to Animals, a humane society. Their attention should be called to the granite block. There is not a more cruel or more inhuman thing over which horses can travel than a granite street. After a granite street has been down for five years, the top becomes rounded, and every step the horse takes is a short, sharp slip, bruising every joint and ruining the horse. I am not going to take up much more time, but there is one thing that I want to impress upon every man and beg every man's influence in this Association and that is, to see that the specifications of the National Brick Manufacturers' Association adopted and from time to time that they be carefully and skillfully carried out. We have not written them in a hurry, we did not write them in an hour, we did not write them in a week, we did not write them in a year, it has taken fifteen years of hard study to determine just what was best and when we came before you with these specifications two or three years ago, we knew what we were talking about, and we haven't a word to take back since they were written. I am going to read you from a little circular issued by a number of brick manufacturers of Indiana which will echo no doubt the sentiments of all the paving brick manufacturers of the United States. It was addressed to the Municipal Convention which met in our city of Terre Haute last year. We called the attention of that Municipal Association to a few points of failure not because of our specifications, but by reason of a lack of skill in fulfilling the same.

"The concrete foundation is not smoothly finished.

"The true grade is not maintained by the concrete surface.

"There must be two inches of sand cushion.

"The rolling is attempted with other than a five-ton steam roller.

"The rolling is often so slight that the brick stand in the street without support. The rolling must be so thorough that no further compaction can be possible."

P. F. Jamieson, Batavia, Ohio.

Gentlemen who are interested in the compaction and rolling of the street, I should like as opportunity is offered that you examine what is shown in this specimen here, by the perfect compaction and rolling of the street. You can see it was driven in the sand about one inch by the rolling and compaction.

"More disaster comes to a brick street from the want of properly applying the filler, than from any other cause.

"A failure to comply with a single direction will easily take away five years of life of a street.

"Do not permit a greater amount of filler, mixed in one batch than recommended—that alone will spoil the job.

"Let the man with the scoop take the mixture from the lower side of the box. Have the man who stirs the mixture stand at the lower end of the box. Let the box be immediately adjacent to the work. The man with the scoop should move but three or four steps at most from the box. Never allow the mixture to be poured or dumped on the street from the box. After going to all the trouble to get a street that will last a generation, do not let the cement bond be broken by using it short of ten days and thus throw away half your money before spending it." (Prolonged applause.)

D. V. Purington: I want Mr. Blair's remarks embodied in that pamphlet. (Applause.) I don't care anything about expense now. (Laughter.)

D. J. Christopher, Chicago, Ill.: Having had the pleasure of seeing Mr. Purington "sweat blood" and the misfortune of being a brick engineer from the city of Chicago, I wish to ask a few questions and make a suggestion. On your two-inch sand cushion, would you recommend two inches of sand right up against the street railway rail, or would you recommend one inch where that concrete foundation is brought to a line. As a rule in putting in a street where there is a street car rail, they have a gauge that is run along the rail, and I have found in a number of places that the sand would shift down into that rail, and let the brick down under the rail, practically a quarter of an inch below the top of it. Again I would like to ask whether it is a benefit to have a space for the cement filler. For instance, some people have devised a patent or something similar to keep the brick apart. It has been a question in my mind whether it is a benefit to have these projections or not. As has been said by Mr. Blair, the brick men are bashful. And it has been suggested that a number of these pamphlets or specifications be printed and sent out broadcast. Now if you want to do some good work I think it will be a good idea for you paving brick men to form an inner organization, the object of which would be to go into a city where they are about to do some paving and get contractor's privileges of putting down a block of brick pavement, according to your specifications, and show them how you would lay a first class brick pavement. There are a great many people who do not believe that you can lay a good brick pavement. In Chicago in the department in which I am connected, I am called a crank on brick pavement, the rest of the department are against me. Some favor asphalt because it is nice to ride over in an automobile or on a bicycle. They say brick pavement will not stand. Brick pavements in Chicago have never had a fair deal, and I think it would be a good idea for the paving brick manufacturers of this country to form themselves into an organization and send out their little specifications and pamphlets and then go into a city and say, "Look here, gentlemen, we will put you down a block of pavement under our specifications, and we will prove to you that you don't know how to lay a brick pavement." (Applause.)

Geo. H. Shellenberger, St. Paul, Minn.

President Purington: I am going to ask Second Vice-President W. P. Blair to preside over the Convention for awhile.

Secretary Randall: I suggest that we now hear the report of the committee appointed by the Executive Committee at their session yesterday, to take up a matter that is of great interest to all of us. Mr. Hunt, who is chairman of that committee has the matter in charge.

Vice-President Blair: We will take this matter by consent and I will ask Mr. Hunt to present the resolution.

Mr. W. H. Hunt: The Executive Committee in its deliberations in its session yesterday, prior to the first session of the Convention, discussed the labor problem at some length and decided that inasmuch as the labor problem was perhaps the most important question before the American people today, that it was quite important that this body of business men, take some action upon the subject before adjournment, even though the printed programme made no reference to this matter, and a committee was therefore appointed from the Executive Committee, consisting of Mr. Anthony Ittner, Mr. Geo. H. Shellenberger and myself, authorized to draft a set of resolutions which might be submitted to the Executive Committee and after being approved by them come before this body. It has been customary for bodies of this character to take up in detail certain phases of the labor question and section by section touch upon the rights of the employer to employ or not to employ and the question of apprentices, but in the judgment of this Committee it was thought wise not to enter into all these questions, which might be termed as questions of detail, inasmuch as the resolution that will be submitted actually comprehends all of these things in a broad sense. I will therefore read the resolution as prepared and recommend its adoption by this Convention.

PREVENTION OF LABOR TROUBLES.

We, the members of the National Brick Manufacturers' Association of the United States of America, in convention assembled in the city of Cincinnati, February 4, 1904, believing the labor problems to be the paramount issue before the American people and that in the proper solution of these problems rests the future security of society, and the assurance of prosperity to our industries, do hereby *demand* that the officials, civic, State or National, impartially enforce the laws of the land and see to it that every man, woman and child, irrespective of position, caste or creed, obey the laws that there may be insured equal protection of the rights of every American citizen as guaranteed by the Constitution of the United States of America.

In harmony with the letter and the spirit of the Constitution of the United States of America which guarantees to every American citizen individual liberty and freedom in the pursuit of life, liberty and happiness, this Association affirms that absolute personal independence of the individual to work, or not to work, to employ or not to employ, is the fundamental principle which should never be questioned or assailed, and that employers and workmen should be equally interested in its defense and preservation.

It is further declared that any movement in this industrial situation which has not as its basis of action an intelligent understanding of the economic questions involved, and which does not aim to solve its problems along the lines of reason and justice to all men, whether employer or employe, becomes a menace to our institutions.

WM. H. HUNT, Cleveland, O.
ANTHONY ITTNER, St. Louis, Mo.
GEO. H. SHELLENBERGER, St. Paul, Minn.

That, gentlemen, constitutes the work of this committee, and the resolution has been approved by the Executive Committee and is presented to this Convention with the recommendation that it be adopted as the sense of the membership of this Association.

Mr. Yohe: I move that without discussion the resolution be adopted as read.

Mr. Ittner: I second the motion and would suggest a rising vote.

Vice-President Blair: It has been moved and seconded that the resolution just read be adopted as a sense of this meeting by a rising vote. All those in favor of this adoption will rise.

The motion was carried unanimously.

Vice-President Blair: The Secretary will please call the next in order.

Secretary Randall: The next number is 'The Report of the Committee on Technical Investigation," by Prof. Edward Orton, Jr. This will be illustrated not by stereopticon views, but by a series of interesting exhibits forming an instructive object lesson.

REPORT OF THE COMMITTEE ON TECHNICAL INVESTIGATION —THE FORMATION OF DARK CORES OR DISCOLORATIONS IN THE INTERIOR OF CLAYWARES.

By Prof. Edward Orton, E. M.

The subject which I desire to present to this Convention, is one which we have all of us taken a hand in discussing in the past conventions. It has been up in every convention which I have attended, of which this makes the tenth. In fact, it is a subject of perennial interest to every brickmaker, in fact to nearly every clayworker, because it is a source of constant and ofttimes important losses. The losses are not confined to any one industry; they are common to all that use crude clays. Nor are they confined to the initial stages of a clay industry; in some cases, they keep up all the time; in many others, they occur at occasional intervals. Nearly every one who burns shale or fire clay has had them occur at some time. And while in many industries losses from this cause have become rare, it is generally because the clay is not of the sort that is most subject to this particular trouble, or that the clayworker has been forced, by the very extent of the trouble, to find how best to overcome this difficulty.

The subject that I want to discuss this afternoon, is the formation of dark discolorations in the interior of clay wares. Black cores, bloaters, blown brick, swell bellies, are some of the names by which they are called among brickmakers. I want to discuss with you the cause of this phenomenon and the remedy.

There are a series of gradations in the manifestation of this difficulty. You get, in the worst cases, brick which have swollen up into a regular sponge, so light it will float upon water. The other extreme is only shown by a minute discolored spot generally in the center of the mass, where it seems in no way to diminish the value of the brick. Between these extremes, you have every possible gradation. I have here (illustrating) a brick, which I made myself, which illustrates exceedingly well a bad case of the difficulty in question. This brick happens to have split longitudinally on its center line and I value it because it is such a nice object lesson for just this purpose. I could have brought hundreds of samples which would represent the facts just a well, but none which would have shown them so prettily. (Passes samples to the audience for inspection.)

Now, a few words as to the causes which have been previously advanced to explain this swelled brick phenomenon. The first theory which has been held—I advanced it myself and published it in a geological report at one time—is what we call the combined-water theory. According to this theory, the swelling is caused by the combined-water of the clay seeking to escape after the ware had been partially vitrified on the surface. It was thought that the heat was raised too fast in the burning, and the combined-water, being gasified at a high temperature, has been imprisoned in the mass of the brick, and causes it to swell in its efforts to get out. It has been evident all along that the swelling has been caused by a gas of some kind. No one can look at that sample, which is being passed around among you, and fail to agree to that proposition. The exterior is hard and dense, but red in color. The interior is spongy and black in color, and between the two areas there is a large cavity. The brick has opened out along its lines of greatest weakness, i. e., its laminations, which have been forced apart by some gaseous substance.

This idea of water being the cause has some ground in fact. Almost all of us who work shale-clays know that if bricks are set when damp, and the burning is at all rapid, that this condition of affairs is very likely indeed to come about, and it is the most natural thing in the world to jump from one fact to another, and assume that the water is what made those brick swell up. This is especially borne out by the fact that where dry and damp bricks are set together, the dry ones are often sound while the wet ones swell. Without stopping to discuss the full merits of this theory just now, further than to say that it is very closely connected with the real cause, as should be called a co-operative or concurrent cause rather than the active cause, I shall pass on to another theory.

The second theory is also one to which I have subscribed, though I did not originate it. It is based on the presence of carbonate and sulphide of iron in the clay. Carbonate of iron is one of the commonest, perhaps *the* commonest, form of iron that is found in clays. We are all familiar with the fact that iron in surface clays generally imparts a reddish or yellow color to them, and that this is the cause of the red color when burned. But in all the large masses of clays, such as the shales, the fire clays, and even the glacial clays where they are found in thick layers, we also note that this yellow or red color does not descend deep into the mass, and the color of the real body-mass of the clay is blue, or slate colored, or gray, or greenish, but very seldom either yellow or red. From an inspection anyone can see that the surface clay is altered by contact with air and water, and that this color only penetrates to comparatively small depths. Only alluvial clays and the outside portions of the other beds are apt to be oxidized.

Now, the blue shales burn red just as well as the yellow surface clays do. Hence, they must contain iron in about the same amount and in the same final form. But the color indicates that the iron of these deeply buried clays is not in the same mineral form as in the surface clays, and a chemical test proves this supposition to be correct. The blue form found beneath the surface, away from the air and weather, is chiefly the carbonate of iron, and it is vastly greater in extent than any other form of iron found in clays.

Carbonate of iron is composed of oxide of iron and a gas, carbonic acid, which can be driven off by heat. The process is very similar to burning lime in a lime kiln, where the heat drives off the gas and leaves the oxide of calcium or quicklime. But when carbonate of iron, either in or out of a clay, is heated and decomposed, another reaction follows, viz: the oxide of iron which first forms, oxydizes to a still higher oxide, if oxygen is available to make this conversion. The first oxide is called the lower or black or ferrous oxide, having the formula $F E O$, while the higher oxide is called the red, or ferric oxide, with the formula $F E_2 O_3$.

It is the red oxide which we want to use in coloring the clay red or buff, and hence where we burn clays containing carbonate of iron, we must not only break up the carbonate, but also be sure to fully oxidize the black oxide to the red form, or our work will be but half accomplished.

There is another reason why this must be done. The black oxide causes clays to fuse very readily. It melts or causes clay to melt about 200 degrees C. below the temperature where the ferric oxide would become an active flux. Hence, failure to oxidize the clay will not only result in a bad color, but by a strong probability of actual fusion. This condition is well illustrated in the swelled brick, which is being passed around among you. The red exterior, colored by the ferric oxide, is not fused, but has merely become plastic by heat. The black, spongy, cindery mass in the center is colored by the ferrous oxide and has been practically fluid. Yet it has not been hotter than the exterior, in fact, it got its heat through the exterior, and could not become hotter than its source of heat, but it is undoubtedly much further fused. Hence we are forced to the conclusion that it must fuse at a lower temperature.

Acording to the carbonate of iron theory, this brick swelled because the heat was raised too fast, and the iron in the interior of the brick was not given a chance to oxidize. The heat advancing finally to the point where the ferrous iron in the interior of the brick attacked the clay, fusion followed in the center, while the exterior was not near fusion. The gases liberated caused the center to become spongy, while the stiffly plastic exterior was bulged out by the interior pressure. As will be seen, this theory seems to fit the facts very plausibly.

PROF. EDWARD ORTON, E. M., Columbus, Ohio.

There is a third theory which has been advanced from time to time. It has been brought forth as a side issue, not as an important one. This theory requires the presence of a solid substance in the clay, which is called a reducing agent. Carbon and sulphur are the two prominent reducing agents available.

A reducing agent, so far as we need to understand it here, is any substance which is hungry for oxygen, and which would therefore tend to take oxygen away from the red iron oxide, converting it into the black oxide or even into the metal. In the case of the iron locked up in the interior of a brick, the reducing agent might merely intercept the oxygen, which would be coming in through the pores of the clay, and thus keep the center from oxidizing, without actually reducing it from a higher to a lower state. It is immaterial whether the reducing agents acts by prevention of oxidation or by actual reduction of a previously oxydized body, its effect in the brick is the same. It allows the ferrous silicate to form in the center of the mass and cause the swelling and black core.

You will observe that this reducing agent theory is not a direct cause—merely a related or accessory cause—it is still the oxide of iron which does the actual mischief and the reducing merely assists in determining whether the iron shall be in this harmful black state or in the desirable red condition.

There are quite a number of other theories which have been mentioned from time to time by different persons. Some of them have been subject to some little discussion. Sometimes they have been advanced without regard to the chemical principles involved. I shall not take up your time in discussing these. But the three first given have all of them the color of the truth, and might be readily accepted by one who had some knowledge of chemistry.

In the first place, let us discuss the water theory. At one time, I held the water theory strongly, but this was prior to the time when I began to make exact experiments. As long as I went about from plant to plant and observed, and as long as I observed in my own kilns, without making actual experiments as to temperatures of dehydration, etc., I held tenaciously to this theory. I saw that the setting of wet or dry ware made the difference in our kilns between bloated brick and sound ones, unless we took extra time to thoroughly dry out the kiln before raising fires on it. I soon recognized that there was a hitch in the argument, however, for the amount of combined water is not influenced by the dryness or wetness of the brick when set, and hence the condition of the brick in setting ought not to be apparent, if the combined water was the real cause. And yet the connection between wet ware and swelled brick was too clear to be set aside.

After I got to experimenting under more accurately controlled conditions, I found positive evidence that the moisture contained in the brick on setting could not be the actual cause, though it might very easily be an accessory cause.

These two brick (holding up two, which were stuck together as one mass) illustrate this point. Both were bone-dry when set. One swelled and the other did not. They were not composed of the same clay, though they were of a similar material, both shales. Evidently it could not be mechanical moisture which made the difference, and hence it must be something in the clay itself.

Similarly it was pointed out by others and verified by myself that clays which have lost their water of combination are very soft and porous still and could not possibly get tight and dense so quickly as to allow the exterior to seal up the steam in the interior and thus cause swelling. Several hundred degrees elapse between the loss of combined water and the swelling, and during this process the clay is gradually getting harder and denser and less permeable to gases from without and within.

J. W. Rust, Hartford City, Ind.

How then, shall we explain the evident connection of water with this process? Its action is purely indirect—the original mistake was in calling it direct. The influence of the water comes in the fact that it takes a great deal of heat to evaporate water, and if you will enter into a calculation on the subject, you will find that it takes almost as many heat units to dry a moist brick, as it comes from a stiff mud machine, as that brick will contain when white hot. If you will actually take the weight of the water and the weight of the brick, you will find the brick when white hot only has a little more heat in it than is needed to drive off the water from a wet brick of the same sort. So that if one brick enters the kiln wet, and another brick enters it dry, it is quite possible that the one which enters it wet will use so much more heat in the early stages of burning in getting rid of its water, that the other chemical reactions depending upon heat are delayed, and therefore it gets behind the rest, and is caught by the rising heat before it is ready for it, and therefore it swells. This explanation does not show you the cause of the swelling, but simply the connection of the water with it.

Now as to carbonate of iron theory. It also does not entirely hold out. I thought it did when it was first advanced, though I hated to give up the water theory and accept this other one, as a matter of personal pride. But I had to give in, for the carbonate of iron theory seemed much the more plausible of the two. In the first place, the clays which give the trouble by swelling are very largely the shales and fire clays, which contain their iron principally as carbonate. Clays on the surface which are well oxidized when they go into the kiln, hardly ever give trouble from swelling. Also, shale pits which are oxydized on the surface work nicely and the bricks do not swell, but later, when the bank is more deeply cut in to and the blue interior is worked into brick, then the swelling begins and results in enormous losses before the correct treatment to avoid it is found out.

But experimenting and observation again showed that the carbonate of iron is not the real or fundamental cause, though its connection and importance as an accessory cause is unquestionable. Just as in the water theory, it is an indirect cause, though closer to the real cause than the former.

The following very conclusive experiments as to the influence of carbonate of iron was made by taking some iron ore. I got some friends of mine to send me some iron ore of the carbonate variety. I cleaned it off, pulverized it thoroughly, and made it up into little briquettes, and after weighing them, put them in a little kiln, and fired up, pulling one out every few minutes. When cool I weighed it again. I found it showed no change in weight in the early stages of the heating, but I found at 400 degrees C. that it began to lose its weight rapidly and at 450 degrees C. it ceased changing. The carbonic acid had been expelled at this low temperature, whereas clay ware never swells at less than 900 or 1,000.

How then could the carbonic acid from the iron ore be the cause of swelling when it has about 500 or 600 degrees C. in which to escape. And also, why should the iron fail to oxydize to the red form and permit the safe burning of the ware, if it is free to combine with oxygen from 450 degrees C. on up to 1,000 or more?

Another fact. I have here (holding up a small piece of clay ware) a clay which contains no carbonate of iron. It is a surface clay, deposited along a river bank. It was put into a kiln, and under an unusually short period of firing it has black-cored and swelled, just as though it contained carbonate of iron. It is a scrap of drain tile, which I picked up in a tile plant near Ottawa, Ohio; it lay on the scrap pile with many others. You see it shows this blue core. This clay had been thoroughly oxidized before it went into the kiln, so it was not due to carbonate of iron. But the fact that the clay had been in the upper stage of oxidization did not hinder it from blue-coring.

If, therefore, we find that we cannot burn clays containing carbonate of iron without blue-coring and can blue-core clays which do not contain carbonate of iron, and can show that carbonate of iron decomposes far earlier than was thought and far earlier than the water of combination is expelled, and thus gives a long period for the oxidation of the iron to take place, it makes this theory quite untenable as a first cause.

This brings us to the third theory, viz: the one in which black-coring and swelling is attributed to the presence of solid reducing agents in the clay.

In the light of these other disclosures, this theory was also thought to need further investigation, and it was taken up as the subject of this year's work of the scholarship in the Ceramic Department of the Ohio State University, provided by this Association. If, as the result of the expenditure of this $250 we shall prove the real cause, and the exact conditions which produce this phenomenon, I submit that the money will have been well expended.

Now as to the steps taken to prove the truth of this theory. In the first place, it was necessary to know to what extent clay contains these solid reducing agents—carbon and sulphur. Without taking up any extended investigations I have reached the conclusion that carbon is practically universal in its distribution. The remarkable fact is that we hardly ever see it referred to in a clay analysis. I believe as a result of the work accomplished that we shall find that the one agent in the clay which is responsible for the most of the troubles which we have to overcome in burning is the one element that chemists have always ignored in their reports, and hardly ever refer to in making analysis of clays. I plead guilty myself. I have analyzed many clays, but I do not believe I ever determined the amount of carbon the clay contained until I got into this work.

Ordinarily we put the clay in a little crucible and weigh it, and heat it up, and see how much matter is expelled by the red heat and then say the clay lost by ignition so much water, or other volatile substance. But we have not been accustomed to differentiate between the carbon and water, both go off together in this ignition, but as a matter of fact one is highly important to the behavior of the clay in burning and the other is not.

If you go into the history of clays you see naturally why carbon is naturally present in most clays. Carbon compounds are suspended in the water, in the ponds and rivers, or the ocean itself. In almost every instance clay beds have been associated with water in deposition and in this water there is certain to be considerable quantities of living things, or the products of life. For instance, roots, grasses, dead leaves, and all sorts of products of animal and vegetable life are deposited with the clays in swampy pieces of ground. The same is true of the mud forming in larger bodies of water. The clays forming under water are almost sure to contain a great deal of organic matter in all stages of decomposition. Of course where this material is freely exposed to the air, it rots and the clay does not contain much residue of it, but a great deal of it being covered by the water, the air does not get access to it thoroughly, and the clay therefore remains impregnated with carbon and destructible matter. In the surface clays recently deposited you are apt to find it in recent forms, grass, roots, leaves, woody tissues. In the fossil clays, like fire clays or shale, this woody condition of the tissues has been changed until we cannot recognize it as wood. In fact, with a microscope, we find it as little coaly particles. Sometimes the clay has been metamorphosed by heat and pressure and different products have resulted, producing a sort of tarry or bituminous matter. Sometimes, we even find a clay that burns like coal, from the amount of carbon it contains. The essential fact to remember, however, is that whatever the age or present location of a clay bed, it is exceedingly likely, in fact almost certain, to contain carbon in some form and in some amount, and that the older, deep water clays like the shales, generally contain enough to be able to exercise an important effect on the clay's behavior in burning.

The next point that was necessary in proving this case was to show that this carbon in the clay burns out steadily if given a chance in the burning of the ware in the kiln. I have in this box here (showing a case of samples) ten samples. I made these brick out of a shale containing practically 2.71 per cent. carbon in the form of bituminous matter. I made them up very carefully. They were made by hand and repressed in a special die, the work being done in my laboratory and after thorough drying, were burned in one of the test kilns in my department. The whole set amounted to 30 or more bricks and they were so placed that they had a uniform heat treatment. The heat was brought up to 500 degrees C. as rapidly as convenient, after the drying was completed, and a sample brick was then drawn, cooled, broken in two across the center with a chisel and is shown here as No. 1 of this series (indicating the box of samples). As you can see, none of the carbon had burned out, and the brick is black clear to the edge. Here in this sample drawn after eight hours more, during which the heat was steadily held at 550 degrees, you can see a little white line, about an eighth of an inch deep, where the carbon has yielded to that extent to the hot air surrounding it. After 19 hours it had gone in 3-16 of an inch. After 43 hours the black spot was still decreasing in size and after 67 hours it had got down to one-third of the area. At 105 hours it had gone down to a little speck, and only after 123 hours steady firing did it disappear altogether. Perhaps it went off before the 123 hours, but I had only two briquettes left, after the 105 hour sample was drawn, so I wanted to make very sure of it, and therefore fired for 18½ hours more before drawing my next test.

The point I wish to impress is that it took 123½ hours, or over 5 days steady firing, at a temperature running from 550 degrees to 650 degrees C., or red heat plainly visible in daylight, to burn 2.71 per cent. of carbon out of this clay. To be sure, the amount left in after 60 or 80 hours was small and perhaps would not have done much harm if the kiln had been finished at once from that point, but the idea here was to show you what an exceedingly deliberate thing this burning out of carbon sometimes is.

When at last it was all gone, I finished off the kiln to cone 1 as fast as I could, and as you will see, when I finished, I had a good, hard, red paving brick of fair structure and strength, and I got it out of as bad a clay as any man could wish. I desire to call attention to the fact that if you even give a bad clay time to fully oxidize, you can make its burning perfectly safe and can vitrify it with no sign of black-coring. This fact seemed to be demonstrated.

The next point I want to show in this connection, is illustrated by this second box of samples (showing box No. 2). The brick were made from the same clay as box No. 1 in every respect, and were similarly prepared and burned, except that the temperature was allowed to go up normally instead of holding it for hours at one point until the carbon was burned out. Here is a brick drawn at 550 degrees, in 18 hours' firing, and here is another drawn at 1,000 degrees, in 30 hours. These periods will seem short to you gentlemen, but consider I only had a few pounds of clay in the kiln altogether, and it is not at all the same thing as when you have a big kiln containing more tons than I had pounds. Thirty hours' firing for this material was very deliberate compared to 7 days for an ordinary sized kiln. You will see there is a very large black center, showing the carbon was unoxidized. Here is one drawn after 35 hours' firing, at cone 1, in which a little red vitrified line shows on the outside surrounding the black center.

It is hard to show to an audience, but those who are near can see that the center has opened up in big cracks and is becoming spongy. This sample (indicating) is one of the series allowed to cool in the kiln after some hours at cone 1. It shows a typical case of black-core or swelled brick. But these blackened, swelled bricks are just the same clay as the ones first shown you. In the first series I brought up the bricks to a red heat, and kept them there until the carbon was gone, and then finished burning at cone 1, with good results. In the second I raised the heat steadily and consistently but not rapidly to cone 1. This did not give time enough for the carbon to burn out, and I got a very bad brick in consequence.

By means of these two sets I have already shown that where a clay contains considerable carbon, it may be burned safely to a good product, if the carbon is first burned out fully at a low temperature, and then the brick is brought to vitrification. I have just as clearly shown that if the brick is carried to the same vitrification temperature without burning this carbon out first, that a black and swollen core results. I think that it may be accepted, therefore, that the carbon has something to do with the case. Having set this before you, I want to take up now the study of the factors which are in control of the burning out of the carbon and see if it is not possible to determine which is the best way to manage the process.

Before taking this matter up, however, I may say that in the same burns shown above, I had sample bricks of other clays also, and some of these which contained but little carbon were as well burned in the second burn as in the longer one. This proves that the short burn was not in itself too short, but merely too short for a clay containing much carbon.

There are various factors in the burning out of the carbon which I have tried to demonstrate. Let us consider first the influence of time versus temperature. I have shown in my first box of samples that it took at this temperature actually over five days of steady firing at a visible red heat, viz: 570 degrees C. to burn the carbon out of this clay. The question then arose, can this time be reduced? If it took so long for these few brick in a test kiln, how long would it take to burn that clay safely with 100,000 in a large kiln?

I next made up another set of bricks, just as before in every respect, except that it was raised to 700 degrees C. and held there until the carbon was burned out. Here is the result (showing box No. 3). You'll notice that the progress of the burning is about the same. The samples shown were drawn out at five, ten, twenty, thirty, forty, sixty, eighty and one hundred hours. Some where between 80 and 100 hours the last of the carbon burned out. Probably at about 90. And having burned it out, I again raised the brick to cone 1 and got as good a product as I had before at 123½ hours. This test showed that I could save some heat by raising the oxidation temperature to 700 degrees C.

R. D. Culver, Veedersburg, Ind.

The question then was, could I gain any more by going higher? Here is a fourth set (showing box of samples) burned at 800 degrees—100 degrees higher; 800 degrees C. is a pretty clear red heat, so hot that you can readily see a long distance in the kiln. It is not what you call a cherry red, but a good, clear red. Note that the progress of the oxidation is again about the same, except that the carbon spot at 80 hours is a little smaller than before, and a little bluer, indicating that there was less carbon left in it. At 100 hours it was gone, and again I burned up to cone 1. The carbon left between 80 and 100 hours, probably at about 85 hours.

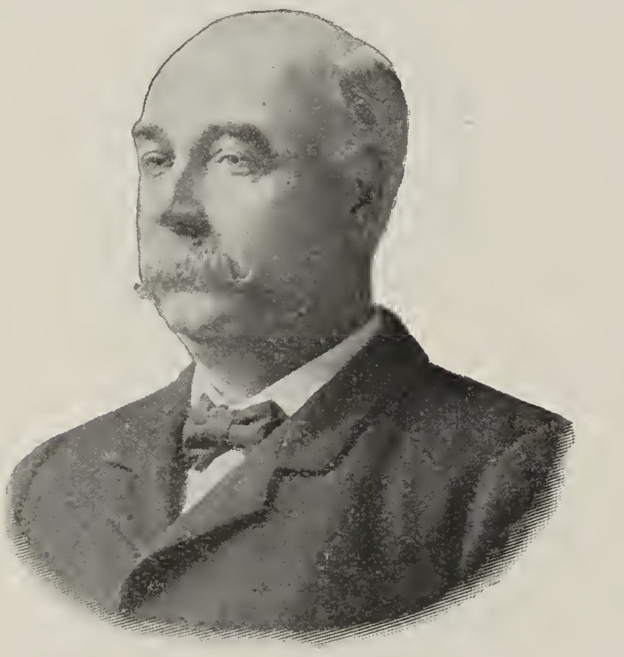
The fourth burn was much less successful in cutting the time down than the third. Having gotten this result at 800 degrees C. I tried another series at 900 degrees C. These samples (showing box of samples) were burned at 900 degrees, which is a cherry-red heat. This one (indicating) was 10 hours, the next 30, the next 40. You will see the spot of unburned carbon is about the same at 40 hours as the previous series showed at 80 hours, and at 56 hours it was all gone.

I then tried another degree higher, 1,000 degrees C. This set (indicating) represents this experiment. 1,000 degrees C. is hotter than you ordinarily get at the so-called cherry-red heat. It has a shade of yellow in it. It took a longer time to get up to this heat than in the preceding burns. I pulled this first sample here (indicating) one hour after it had reached 1,000 degrees. The sample drawn after twenty hours at 1,000 degrees C. showed a reduction in the size of the carbon spot. At 40 hours there was no sensible reduction over the 20-hour sample, and again at 52 hours was very little improvement. The brick were getting harder and denser, but were not sensibly losing carbon. This series indicates pretty clearly that it is not worth while, at least with that clay, to go as high as 1,000 degrees C. in burning the carbon out. It is better to stay down below that, because we have shown that at 900 degrees C. it burns out in one-half the time that it does at 800 degrees C. But if you go higher than 900 degrees, you seal up the pores of the clay by vitrification and the air cannot get into the center of the bricks and the carbon cannot get burned out.

I think these five series of tests have conclusively shown that the time and temperature factors are indissolubly tied together. It will take a longer time at a low temperature, and a shorter time at a higher temperature. The high temperature limit is set at the point where the clay commences to vitrify, for this clay 900 degrees C. is about the safe limit.

I tested two other clays at the same time and in the same burns, but will only talk a minute about them. One was a fire clay, and the other a common surface clay, such as is used for soft mud brick. The soft mud clay could be oxidized safely at 1,000 degrees C. with no danger, because it contained so much sand. It only took five hours at 1,000 degrees C. for that clay to lose all its carbon and become a perfect brick, whereas with the fire clay it took 52 hours. I had exactly the same experience with the fire clay as I had with the shale, namely: that it is useless to try to burn the carbon out after the clay hardens and becomes partially vitrified.

The evidence then shows that with three different clays, the same phenomena are shown throughout. Each chars and turns black at 500 degrees C. or below. Each begins to burn out its carbon at about this same point. This process takes time—the sandier the clay and the opener its structure, the easier it is for the air to get in and for the carbon to burn out. The process goes on faster at higher temperatures, until the clay begins to vitrify. When this point is reached, the carbon soon ceases to burn out, no matter what the heat is, for if air can not get through the dense clay, the gases from within cannot get out either. The temperature when this limit by density comes, depends on the clay. Two of these clays reached the point practically at 900 degrees C. or had passed it at 1,000 degrees C.


JOHN MILLER, Washington, D. C.

Another factor which enters into the burning out of the carbon, is the influence of the composition of the gases which circulate through the kiln. These gases are made up of a mixture of pure air, and air which has been used up in the combusion of the fuel. This combustion produces carbonic acid , steam and nitrogen, none of which can assist in the burning out of carbon from the clay. The power of the gases to burn out the clay depends therefore on the free or unused air in them. The more free air they contain the better, but of course the limit comes from the cooling effect. The pure air will burn out the kiln gas a great deal faster than air diluted with combustion products, but it will also cool the kiln down very fast. So there are two influences, one working against the other.

In order to demonstrate the much greater oxidizing value of pure air, I decided to make another series in which I would subject the bricks to the influence of pure air alone, heated to the temperature of 800 degrees C. I tore out the interior of a kiln and built in it a small muffle, and covered it over, and afforded every protection possible to make it as tight as I could, in order to overcome the leakage of kiln gases into the muffle. I put three iron pipes into it running to the outside air and bored them full of holes to spray the air in through numerous small jets. I covered these pipes over with a layer of grog, so that the air would rise gradually up through the grog and disseminate itself over the bottom of the muffle in a steady stream. I put in my brick, closed up the muffle and having gotten it up to 800 degrees C., I pulled out a sample of the air and found that it was practically pure. I tried it time and time again, always with the same result.

Considering now these first three brick I have here (indicating), this represents five hours' exposure to pure air at 800 degrees; this one 25 hours, and this one 30 hours. So you see it has shortened the oxidation period down from 85 hours ,as in the case in the first 800 degrees burn, to 30 hours in this one, showing clearly that the brick, when heated in pure air, will be burned in less than half of the time, practically one-third of that occupied in burning them in an atmosphere of waste gases.

The question at once arises, is there any thing practical in this experiment? It would be practical for me, but would it for you? By what means could brick be burnt thus in large kilns? There is one way, i. e., by use of muffle kilns. Consider the muffle kilns used in the terra cotta business. They are large structures, loaded with many tons of ware, which is carefully protected from the flow of combustion gases. These combustion gases flow up around the muffle, sometimes down through a center stack, and out under the floor again before they escape to the air. The muffle itself is ventilated with pure air. These kilns burn off in about four days. We ordinarily burn a similar weight of ware in common, round, down-draft kilns, in from seven to eight days. How is it then that terra cotta is able to burn off so much quicker and with such excellent results, as to color? Terra cotta muffles are nearly all so constructed that a current of air goes in at the bottom through the trial holes going up to the top of the muffle, out through the roof of the kiln. The air passes through in limited quantities, and the result is that the burning out is done in pure air. The terra cotta man burns in about half the time the brick man burns an equal weight.

In pottery manufacture where they burn in saggers, it is just as easy as not to get this blue core. We have to be just as careful about black-coring in burning in saggers, as in the ordinary way, because the saggers do not protect the ware from the kiln gases. Free air cannot get to them and therefore they burn out slower just as brick do.

But it must be freely admitted that it does not pay to burn common brick or any other common clay wares in muffles. The great additional cost for fuel, and the loss of time in setting and cooling and repairing, makes it out of reach for any but wares which reach a high price per unit of weight.

But nevertheless, it does not follow that we cannot to some extent reach the advantages of burning out or "oxidizing" a clay by the pure air treatment in a common down-draft, or still easier in a common up-draft kiln. Suppose we purposely or accidentally let the heat drop from redness to blackness—or from 900 degrees to 500 degrees. This happens every day somewhere. The burner goes to sleep—or the coal pile runs short, or something happens. As fast as the fires burn low rich, pure air goes into the kiln in place of the clouds of worn out, spent combustion gases, and while the heat is dropping the oxidation is making steady gains, more rapidly, two or three times over, than it could do if the heat were held constantly at red heat.

Now, I know that every brick burner will protest against this method of burning. We all have heard repeatedly about how hard it is to get a kiln to go up again if it once goes down. There is a good deal in this. It is difficult, especially when the grate area is too small for the kiln space. For most clays and most kilns, I believe this process would be wasteful and ill advised. But where we have to deal with a clay containing an exceptional quantity of carbon, the case is different. If the amount is not too great, the air should be freely admitted after 800 degrees C. or so is reached, and the combustion of the carbon itself will materially lessen the fall of the temperature, and the oxidation will be wonderfully hastened. If the amount of carbon is very great, say 5 or 6 per cent., then the heat generated by this cause alone is too great, or rather too rapid. Six per cent. of carbon in a kiln of 50,000 bricks amounts to 12 tons of fuel, and this is distributed so as to get air over an enormous area. The result is that instead of oxidizing safely and slowly, the heat rises by leaps and bounds and fuses the clay long before oxidation has had a chance.

In such a case, to allow full access of free air would be like touching a match to a strawstack. The thing to do is to stop firing, plaster up the fire holes and peep holes and shut off all possible air supply. Enough will leak in in spite of you. The kiln will thus burn, with restricted air supply, until finally the fuel burns out without at any time reaching a fusing heat. When the carbon is gone, then open up the doors, let in the pure air and let it have full sweep until the reduction caused by the previous conditions have been reoxidized and the kiln properly prepared for the final raise in temperature.

I have several cases of this sort in mind. Some where the clay naturally contains so much carbon as to make this method necessary —others where the carbon is added to make spongy wares, like fireproofing and terra cotta lumber. The treatment is the same in either case.

It makes a great difference what form the carbon is in, in the clay. Five per cent. of tarry bituminous matter is vastly more dangerous to a kiln than 15 per cent. of anthracite culm, because it is inflammable and burns so quickly. The anthracite merely glows and burns away slowly, so that no rule can be given in the matter, beyond saying that if your clay contains a moderate amount of carbon, burn it out with the greatest quantity of free air possible, and do not try to raise the heat till all is gone. If your clay contains so much carbon as to raise the heat too high by its own combustion, then cut off the air supply till the carbon wastes away gradually without at any time passing the danger limit, and then reoxidize as thoroughly as before with excess of free air. If your clay contains only a little carbon, it will burn out without your knowing of its presence and this advice will not be needed.

So much for the question of kiln temperatures. I think I have shown pretty clearly that pure air will burn out carbon faster than combustion gases, but either will get there, if you give it time.

There is another important factor, viz: the density of the ware, which influences the burning out of carbon. I will not say so much about this factor, because I have not finished my experiments on it as yet.

The first point is the clay itself. Some clays are naturally exceedingly dense. Fire clay is apt to be a dense bodied clay and is therefore slow to burn out; a shale, because it is not a very plastic clay and as a rule has to be ground in a dry pan, is apt to be granular in its structure, so that it burns out a little easier. But the shale is apt to have more carbon in it, and hence it loses in this respect what it gains on account of granular structure.

Another factor is the density produced by water. The soft mud process makes a very soft, pasty body, which has a porous, spongy structure when dried out. It is easy to burn out carbon on this account. In the stiff mud process, less water is used, and a denser body is thus produced. The semi-dry press process, using still less water, is still denser and is still harder to oxidize. On the other hand the dry press process, though using little water, is generally easy to oxidize, for it produces merely a physical bond between the clay grains and is therefore readily permeable to gases. It is not safe to say that a dry press brick will burn out faster than a soft mud brick, because there are other factors than water content.

Density is produced as well by actual pressure itself. You can press clay harder, or softer, as you all know; the harder you press it, the denser you make it, and the harder it is for gases to penetrate. And lastly, there is the density produced by fine grinding. The finer clay is ground, the denser it may be made in pressing and the harder it is to burn out.

One last point as to the factors which control the oxidation, namely, the amount and kind of carbon. Obviously the rate of burning depends upon the amount of carbon, whether you have a great deal or a little. Before completing this work, I am going to make a series of tests in which I shall purposely put in carbon in various amounts and then observe the rate at which it burns out, so as to see the relation between quantity and time.

I have now shown that carbon is generally present in clays, and that it must be removed before the clay can develop its best qualities, and that if it is not removed before vitrification takes place that discoloration and possibly swelling and entire worthlessness is likely to follow. I have also shown the conditions which affect its removal; time, temperature, air supply, density of clay, whether due to water content or process of manufacture or pressure in the die.

The question now arises, How shall we know when our clay is oxidized and ready to go on to the vitrification period

Luckily, this question can be answered in a very simple and easy way.

In the first place *set dry ware.* In the next, heat it slowly to a moderate red heat until the carbon is gone from the ware. Determine when this is finished by pulling out and breaking them open. If I can do it, so can you. All you have to do is to put in some bricks at convenient points of access and at the top, middle and bottom of the kiln. Commence drawing trials when the kiln gets red. The trials will show carbon spots in the middle, just like these (indicating). Keep your kiln going along slowly, until finally a trial drawn from the bottom is clear. This advice, of course, is for down-draft kilns. Up-draft kilns, as a rule, are not burning this kind of clay. Even if they were, the advice would be merely reversed, and the last trials would be at the top.

I am not advising you to learn new methods of firing, or chemical formulae, or to study mathematics, or anything else that is different. I am simply advising you to pull out bricks, break them open, and see when the carbon spots are burnt out. You will know then that the danger is past. Setting your ware open, naturally helps the oxidation. It helps, because it lets the free oxygen in, and lets the pure air get around your brick. Making your brick as spongy as you can will help. Some people *must* make dense ware, but other people *can make* spongy ware without damage to themselves and it is a help, if your clay if full of carbon.

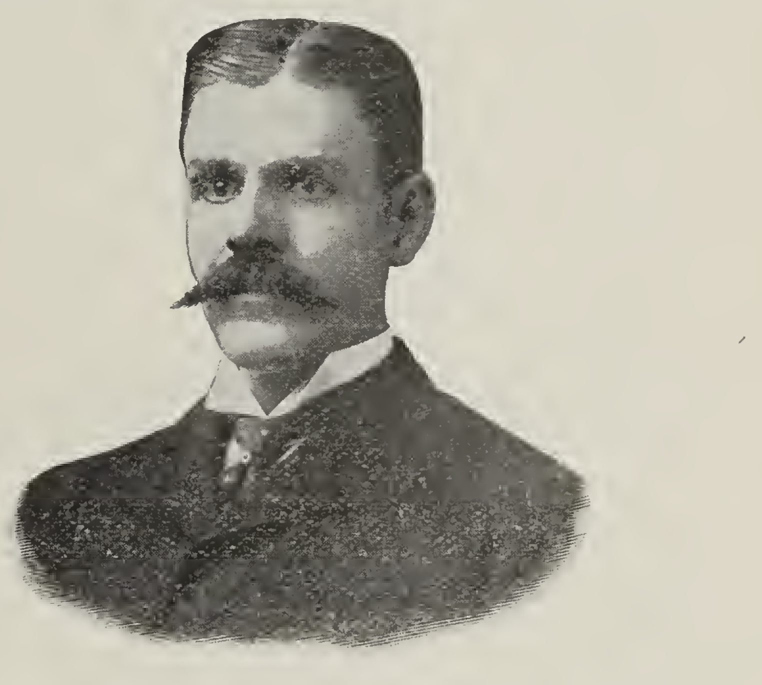
Summarizing, first, carbon is practically always present. That statement may be objected to by some chemists, but I think it cannot be severely assaulted. I have never tested a clay yet where I did not find it. The trouble in dealing with it, is what caused me to take up this subject. If you are having a clay analysis made, ask to have the carbon determined. The chemist may not want to do it, but he will, if you insist upon it, and it is one of the most important things in the analysis to you. The carbon is generally harmless, especially in surface clay, because it is usually small in amount and the clay is fired in kilns which are burned slow enough. The average common brickmaker does not have any trouble from it. Many of you do not realize that your clay passes through this stage, but it does. The fire clays very frequently do not contain enough carbon to have this trouble. I was almost going to say that they do not contain enough to be able to make trouble, but that is not true. I think carbon is the most common trouble in burning both shale and fire clay. Any ware made may be damaged by this carbon. I submit this little piece of tile here to show that a clay, as easy to burn as any of you will ever find, may yet be ruined by failure to oxidize. All you have to do is to keep your fire under control and the temperature down, until your trials show you have reached the end of the oxidation. Any brick may be carried through safely, if you will take the time to burn off the carbon, though where it is present in any great quantities, it may be very difficult and possibly not a profitable clay to work.

Second, the really new point of this report is the work done to show where to reach the most favorable temperature for oxidation. I have never seen it stated before just what that point is. These series represent at least one week's preparation and firing, besides the time spent getting ready the briquettes. So that in the work shown here there is half a year's steady work.

I have told you that the best point of oxidation is between 800 degrees and 900 degrees C. for the average clay; it does not pay to go too low, and is fatal to go too high. Anything which increases the density of the clay is against oxidation. Anything which decreases the ease with which the pure air reaches it is against its oxidation. In short the oxidation period is one of the three fundamental stages of clay burning. First, the driving out of the water. Second, the oxidation of those solid substances which are capable of oxidation. Third, the vitrification of the remainder of the clay. Of these three periods, the middle one is the least understood, but not the least important. (Loud and prolonged applause)

General Discussion.

Vice-President Blair: There are some persons here from whom we wish to hear on this subject. We would all like to hear from Mr. Lemon Parker, St. Louis.



W. H Nesbit, New York City.

Mr. Parker: Mr. President and Gentlemen.—I would like to say that what Prof. Orton has said on this subject, has been of very great interest to me, for in the fire clay business, we introduce carbon into our material for the express purpose of burnit out and leaving it more porous. All that Prof. Orton has said about the action of the burn has interested me very much. In burning our ware, we use a much higher temperature, we go up to something like 2,000 or 2,500 degrees in our burning, but we have to burn slowly at first in order to expel most of the gas. We have introduced into our bricks other matter with the carbon, so we will not get too much combustion at one time; if we do get too much, we spoil the ware. We do not come in contact with the swelling which he has shown in his samples, because our material is too porous, but it sometimes all goes to pieces in the shape of powder. If the heat gets too strong, we have to go into the kiln with a sledge hammer or a bar and get out the ware. It does not swell, it simply fuses all together. All the final burning of the kiln is done with the carbonaceous matter in the clay.

W. S. Purington: The Professor speaks of pure air. That is all right, but it costs money to heat that air. We have found that we have got to be careful about the free air. We had a little experience along that line this Fall. After visiting one of our neighbors, we found that he was burning a large amount of free air, so we made openings through the grates and let in a great deal of air, and the result was, it costs us about a dollar a thousand more to burn, than it had previously with about the same results.

Mr. Parker: We burn our kilns at the end by closing them up entirely and depending upon the leakage of the kiln to allow the air to enter.

Mr. Gates: I just want to say a word. I think this is a most remarkable illustration and a most remarkable example of clay experimental work that I have ever seen. And it occurred to me as I sat here, I could not help but think what it means to the clayworkers of the United States. A little experiment that has cost this Association $250 in cash (of course it has cost an immense amount of priceless time to the man who has given his devotion to it), but is going to save money to you and to me and to the other clayworkers of the world. It is as clear a demonstration of experimental work as I have ever seen.

Wm. Sutton, Table Rock, Neb.: I would like to ask Prof. Orton, if he can tell us, if he kept any record of the amount of iron which this clay contains.

Prof. Orton: Nearly all of these test pieces are of one clay and nearly all contain between 4.5 to 5.5 per cent. of iron, enough to make the clay burn red. The amount of iron practically the same throughout. So it cannot be the different amounts of iron which makes the different colors. As to whether it is possible to observe a difference in the kind of coal, etc. Some coals burn very open, do not clinker at all, do not tend to spread out over the grate bars. Such coals naturally show oxygen in the kiln gases in great abundance, and you would have to put on a thicker layer in order to make such a fire tight. Other coals flatten out and run down through the grate bars, so the air cannot get in. I tried in what I say to lay down no dogmatic laws as to what any particular one of you should do about his firing. I tried to lay down the general cause of the trouble, and the remedy, and to leave it to each one of you to apply to your own individual cases. You will have to pick out the laws that apply to yourselves.

D. P. DeLong, Glens Falls, N. Y.

On motion the Convention adjourned.

FOURTH SESSION.

Friday Morning, February 5, 1904.

President Purington: Gentlemen, the Convention will come to order, and I am going to ask First Vice-President Blair to take the chair for a while.

First Vice-President Blair: Secretary Randall will kindly announce the order of the programme.

Secretary Randall: So far as the programme is concerned, for the benefit of those who were not present yesterday, will say we took up this morning's programme yesterday morning, and this morning we are to take up Thursday morning's programme. The first regular paper for the session is "Sand-Lime Brick from a Brickmaker's Point of View," by Daniel P. DeLong, Glens Falls, N. Y.

SAND-LIME BRICK FROM A BRICKMAKER'S POINT OF VIEW

By Daniel P. DeLong, Glens Falls, N. Y.

Gentlemen of the Convention:

You have undoubtedly heard that old saying, that "Fools rush in where angels fear to tread," and that was about how I felt when your honorable Secretary asked me to read a paper on this subject.

About one year ago, when we met in Boston, as a brickmaker's association, if any one had told me that I would read a paper on Sand-Lime Brick I would have told them I guessed that they did not know what they were talking about.

Well, a short time after getting home from Boston, a gentleman dropped in at my office one day and pulled out of his grip three bricks, and said to me, after I had looked them over carefully, "What would you say if you could make such brick as that from sand and lime, for a certain price?" (which he named); "would you be interested?" I said, "Yes, if you can prove what you have said to me, I would, most certainly."

A short time after this I visited a plant where they were turning out this kind of brick, and after looking over the outfit made up my mind that in many ways, perhaps, there could be some improvements made on the brick that were being made there.

I then went home and formed a stock company that is now turning out the kind of brick that can be seen by all in the Exhibitor's Hall.

I made up my mind (and have had no reason to change it), that if such a brick could be made from sand and lime, that they were going to take a place in the market and hold it, for the reason that they will take a place between pressed and common clay brick. The pressed brick men can not afford to sell their brick as cheap as the sand-lime brick men can theirs, and the sand-lime brick can not be sold as cheap as the common clay brick, for they have to be handled very differently in every way. My own impression is, that the wear on all the machinery is going to be much greater, owing to the fine sand and lime dust which fills all parts of the factory.

Then, in shipping they should all be packed the same as pressed brick to preserve edges, etc. Of course, this is for a first-class brick.

Now, as to the absorption test, etc., you can all read as well as myself as to what that is and has been. I have seen some of these brick that were almost impervious to water; in other words, I have seen water turned on to these brick and let stand for hours without their taking in any perceptible amount. The brick we make, however, absorb about eight per cent. As to their resisting the frost and cold weather, there is no question about that. At our own factory we have turned pails of water on the brick and put them out of doors and then taken out pails of hot water and dipped them in until the frost was all out of them, and then left them to freeze again; and this we have repeated until we are perfectly satisfied as to what they would stand in this particular. And again, we have taken them when full of water and ice and put them under a steam jet and turned steam on to them until the top of the brick was so hot you could not hold your hand on it, and the bottom of the brick was still covered with snow and ice.

As we have nothing with which to get a crushing test, we sent the brick away and got the following result. The average was 3425 pounds to the square inch. And when you consider that the average crushing strength of good clay brick that go into the New York market is, I am told, about 2000 pounds per square inch, you can see the result is perfectly satisfactory to us.

I live perhaps in as severe a climate as most of you, where quite often the thermometer goes to 30 degrees below zero; and if they will stand this sort of climate I think they will most any: in which, perhaps, you will agree with me.

They can be made at a small additional cost in almost any color wanted, by using coloring matter, of course, and of absolutely perfect shape and almost any shape wanted.

If there could be a law in this country causing all brick made of sand and lime to pass a test or a rigid examination, made by some one in authority—one who was competent to pass on them—and if the brick were not fit to be used they were to be condemned, what a grand thing it would be for the industry! For the reason that all manufacturers of this particular product would know that they had to make a brick that would pass this examination, and there would not be so many to rush into manufacture these brick unless they were confident they could produce something marketable.

Now, these brick, of course, I understand will be condemned by many brick manufacturers for the reason that they will not take the time, or go to the expense of investigating this matter; but if the members here will look into this question as thoroughly as I have done, I think most of you would come to the same conclusion. There is no brickmaker here who can afford to ignore this matter. That we will have poor sand-lime brick as we have poor clay brick, there is no question. Why? For the reason that they will be made in the same slip-shod manner in every detail, and by many who know nothing about brick, but who rush in, thinking they can be made so cheaply, and that there is millions in it; not looking into the question of why this or that is so, but it is so; and for the lack of investigation and thoroughness.

We all know of brickmakers who are constantly having breakdowns and delays. Why? For the lack, is it not, of a little foresight on their part in anticipating that this or that thing will be needed shortly? And, having this thing on hand when the time comes when it is needed, the same thoroughness in detail, that will make good clay brick, will also make good sand-lime brick, and the want of it will cause failures in either case.

Now, I can hear you (in my mind) asking about the cost, what do they cost? I am not going to answer that question, for the reason that while figures will not lie if properly placed, I have found from my clay brick experience, that men figure very differently as to the cost of their clay brick. As an illustration of what I mean, let me say that at one time I was on a brick yard where they burned brick with natural gas, which was fine, and in talking about it with the foreman I asked him what it cost them for fuel, and he said, "Not anything." At the same time they were putting down two wells, and these, with the piping to the plant, were to cost about $5,000, with no certainty as to how long it would last if they struck gas at all.

Now, this illustrates what I mean exactly. Some men that you talk with have made brick for so much per thousand, figuring up to the point only where they close down for the season. You can not stop the interest on the plant investment any more than you can the weather from rotting the roof boards off your sheds, if you should happen to make brick for six or eight months out of a year. No more can an absolutely fixed price be made on the manufacture of sand-lime brick. While my lime might be costing me $5 per ton, the next man in a different part of the country might only be paying $2.50 for his, and, as we all know, coal, labor, etc., all enter into the cost and make a great difference in the same. Now, after we had been running our factory for a year, if you were to ask me what they had cost, I presume that I could tell you what they had cost us, but that would be no absolute guide for you, for the reasons given.

Now, gentlemen, there is plenty of room for this new product in the market, for it is well known to all of us that the day of wood buildings to a certain extent is a thing of the past; the buildings of the future must be of brick, stone or steel, and do we not all of us know what our choice would be. Have we not all of us seen, at the time of large fires, the stone crumble and the steel twist and warp out of shape, and the buildings go down? Also, if a fire wall is wanted, what is it built of? One thing only, brick. Our timber forests are pretty nearly a thing of the past.

We are here to stay as long as we can, and so should build as though we intended to stay, with brick and brick only; whether they be clay brick, sand-lime brick, or any other properly made brick; this is the best building material known, in the long run.

Now, of course, in the erection of a factory we have had many things to contend with, and expect to have many more; but when we run up against these annoyances I am reminded of what a gentleman said to me once when I went into his office to sell him brick, "Well, DeLong, does the brick business have as many annoyances as the paper business?" I said, "I know nothing about the paper business, but certainly the brick business has its share." "Well," he said, "a business that does not have its troubles is not worth looking after." How often that remark has come back to me!

You all know that this sand-lime brick business is a new one in this country. After a time there will be many improvements, and that the improvements will all tend to make a better product is what I sincerely hope. I could give you quite a paper on complimentary things said about these brick, where samples have been sent by us to different architects throughout the country; from the government as well as the State authorities; but this is not necessary. Sufficient for us to know that they will be used and used extensively. Why not? Aren't they equal to any clay brick at any such cost? If not, wherein do they fail? If they will stand the climate and the crushing strength and will become harder the longer they stand, in this latter particular do they not lay over the clay brick even?

If you were to take a piece of Indiana limestone and a piece of our brick and put them under a magnifying glass, I would defy you, except for the difference in color, to tell which was which. Now, there is no hesitancy on the part of the builder to put up as many stories as he wants to of the one; and why should there be of the other? If what I have stated to you is true, and you have only to try it for yourselves to prove it, tell me why the brick have not come to stay?

One year ago today there were only two sand-lime brick factories in this country; today there are in operation and in course of construction not very far from thirty. If there is such an increase in one year, what will it be in the next? It is hardly possible that all these people can be mistaken. We come together from year to year to be mutually benefited by such contact and to learn from one another.

Now, I am not here to exploit this or that system of sand-lime brick; each system undoubtedly has its friends; but I am here to learn all I can about any kind of brick that is good and that will be a credit to the manufacturer who made them; and it is left to each one of us personally to investigate for himself.

I am not going to defend the sand-lime brick business before this Convention, even if it were necessary; for it needs no defense: the product shows for itself; but when this or that man says that they will not do so and so, I would say, go a little slow, else you may be mistaken. For the deeper this is looked into, the more and more thoroughly you will be convinced that it is one of the processes of brick manufacture that is all right.

I say to you frankly, gentlemen, I went into this business for the reason that I thought there was some money to be made out of it, for I am not in the brick business for my health, any more than Croker was the boss of Tammany for his.

Although a gentleman from Chicago that was at my place last fall said if he could stay there he could live to be a million years old—of course I do not wonder at that, coming as he did from Chicago and knowing what we all do of the place; but if I really thought as he did, I would have all my buildings built of sand-lime brick and test them for longevity. (Applause.)

General Discussion.

Vice-President Blair: Gentlemen, this paper is likely to provoke some discussion, this being a comparatively new subject developed in recent years, and we shall insist upon enforcing the rule that each speaker shall be limited to three minutes and shall not speak a second time without unanimous consent.

Mr. A. D. Keyser, Philadelphia, Pa.: I would like to ask Mr. DeLong if he has ever given sand-lime brick one of the most important of tests—that of fire. We know that all important walls are built of brick. In Philadelphia, the building ordinance provides that all elevators shall be inclosed with brick walls in order to provide protection against fire. I would like to know if the fire test has ever been applied to these sand-lime brick.

A. D. Keyser, Philadelphia, Pa.

Mr. DeLong: I would say to the gentleman that there is no question in my mind as to their standing fire. If he were to put up a building of these sand-lime brick and clay brick, making four walls and heating them as hot as he could heat them and then turn water on them, he would find that he would check his clay brick, and that the sand-lime brick would be all right. I have seen these brick taken when they were full of snow and put under the boiler in a red hot fire and taken out uninjured. Another thing, if he will put these same walls up, or the walls to any building, the expansion, from the fire, of the clay brick will tip the walls over, while with the sand-lime brick there is no expansion whatever.

D. V. Purington: I don't want this to count on my time, but I want to ask if that statement is true, why not have these brick take the place of fire brick?

Mr. S. E. Frank, New York, N. Y.: There has recently been issued in the United States a patent for fire brick made by the sand-lime process.

Mr. Jacob Klein: I wish to refer to the statement of the gentleman in regard to the brick wall in case of fire, toppling over, while the sand-lime brick would stand. That has not been our experience. The brick the gentleman experimented with must have been a very peculiar kind of brick, not the kind we make in Baltimore. We can take our brick and soak them in a tub of water and then subject them to a freezing point of four or ten degrees below zero, and then throw them in the fire and take them out safe and sound. Consequently, I do not think the statement of the gentleman that the clay brick would go to pieces would apply to our district.

E. N. Nagel, Clinton, Iowa: I would like to say there is a gentleman here who is making sand-lime brick to be used as fire brick, Mr. Schaffer of Pittsburg, Pa.

Mr. Schaffer, Pittsburg, Pa.: We are making sand-lime brick to be used in coke ovens in Pittsburg. They have been used and a test made. They have been used for the crowns of coke ovens.

Secretary Randall: A question has been submitted by one of the members here that will open this discussion. It reads as follows:

"To produce sand-lime brick, the three important factors are sand, lime and fuel. Can lime be made successfully from marl containing 98 per cent. carbonate of lime? Can fuel be produced profitably with peat? Volatile combustion, 69 per cent., fixed carbon, 22.5; ash, 8.65." Submitted by Jacob Keler, North Judson, Ind. If Prof. Wheeler will answer this question, the Convention will no doubt allow him more than the allotted three minutes.

Jacob Klein, Baltimore, Md.

Prof. Wheeler: Speaking of the ability of sand-lime brick to stand heat. The most refractory brick known in America today that will stand the highest heat are what we call silica brick, provided it is exposed only to dry heat. It is the most efficient brick we have, and these brick are usually of part sand with a small amount of binder. Sometimes this binder is fire clay, sometimes it is lime. If they put too much lime in, the brick will melt. It is merely according to the quantity of lime you use as to whether it will be refractory and stand the heat. This is well known to the trade. I am not familiar with the percentage sand-lime people are using, but this instance of using them for coke ovens indicates they will stand a great heat. They turn a hose on to the coke to cool it off. It is the most violent action any refractory material has to stand, it is known that the silica brick can stand that cold water at a white heat, while ofttimes fire clay brick will shatter. Formerly, we used a fire clay brick entirely and they did good work, but we found the sand mud brick did better, so the new plants have replaced the fire mud brick with the sand mud brick.

As regards these questions which have been submitted by Mr. Keller: "Can lime be successfully made from marl containing 98 per cent. of lime?" Theoretically, it can. That is a very poor marl and would make a very poor lime, but as marl is never more than lime sand, it would, I think be a financial failure. A very simple practical lime kiln could not be used for this purpose, it could only be burned in a very expensive type of rotary kiln, and I doubt if that could compete with a simple lime kiln. While it is possible, I doubt whether commercially it would be practical.

"Can fuel be produced profitably with peat—volatile combustible 69.5 per cent., fixed carbon 22.5 per cent, ash 8.65 per cent." This analysis is correct. There is no peat known that contains 69 per cent. of volatile combustible. That is, this 69 per cent. probably covers about 50 per cent. water and the rest is volatile combustible matter, so this analysis gives no information whatever. But so far as peat is concerned, in this country it has never been a commercial success. The water must be expelled by a powerful press, or by heating and when that 60 per cent. is eliminated, it becomes a very low grade of fuel. But when you can buy coal at the mines for 75c to $1.50 a ton, it don't pay to go into the making of peat at considerable expense and hope to have it compete with coal. In Europe where coal is very expensive, where they are a considerable distance from the coal mines, peat is used with considerable success, but in this country, our coal is too close to the center of industry and too cheap to allow peat to be used commercially.

A. M. Smith, Portland, Ore.: I would like to ask if these brick made for coke ovens would stand freezing weather, and how they get the right proportions of lime to stand the fire.

Mr. Schaffer: The brick would not be strong enough for building purposes, but would stand frost.

Mr. Eudaly: Do they use the same percentage of lime for building brick that they do for fire brick?

Mr. Schaffer: We use less percentage of lime for fire brick than for building brick.

Mr. Bloomfield: I would like to ask something as to the cost of lime what it is considered worth a bushel. This interests me because I have beds of clay land, the bottom of which I have considered good for common brick, and there is beneath it about 30 feet of sand and it occurs to me that we might use the top for front brick and the bottom for building brick.

D. V. Purington: It depends where you are.

Mr. Schaffer: Our lime costs us four dollars a ton, 70 pounds to the bushel.

Vice-Pres. Blair: What does Mr. DeLong's lime cost?

Mr. DeLong: We are in a lime section, where there are three or four companies making lime—the whole country is underlaid with lime rock and it costs us about $4.75 a ton on the car at our works. One place I know of they can buy lime at $2.50 a ton, but this is not a high grade of lime.

S. E. Frank, New York City: I think it has been sufficiently established, both by theory and actual practice, that sand-lime brick will stand heat to an enormous degree and that they show an enormous frost resisting quality. In every instance where fires have occurred the clay brick show up much more poorly than the sand-lime brick. Prof. Wheeler has explained that the sand-lime brick is practically a silicate brick and silicate has an enormous heat resisting qualitiy. I think in his paper Mr. DeLong said he had had certain experiences which were rather expensive to him. Now, we want to learn how to avoid these experiences. If Mr. DeLong has been through them, it might be well for him to tell us what they are and how to avoid them.

Chairman Blair: I would like to ask Mr. Frank a question as to the amount of sand and lime enters into the component parts of the brick and also the quality of the sand required.

Mr. Frank: Being myself in that line, I do not think there is any great secret about it, because while this particular method may be a secret there are others that are not, so that the amount of lime and sand and the kind of sand are pretty well known.

Chairman Blair: Will you please be kind enough to state them? (Laughter.)

Mr. Frank: I was asking for some information myself, but I shall never shirk giving what I can for the Convention. Prof. Wheeler knows that sands will vary in their chemical combinations and that lime will vary, and if you will furnish me the chamical components of the lime and sand, I will be able to answer that question definitely.

Mr. Ittner: How much do you use in your process? (Laughter.)

Mr. Frank: That, Mr. Chairman, also varies. (Laughter.)

Secretary Randall: State the amount approximately.

Mr. Frank: Three, four, five, six, seven per cent. of lime, varying in the quality of lime, and the sort of sand used.

Chairman Blair: That is what we wanted to get at, and will Mr. Frank tell us whether the sand should be free from loam, should it be cleanly washed?

Mr. Frank: A reasonable amount of loam up to about 5 per cent. is not a detriment. Still when it gets finer sand-lime brick men would rather have it out.

Mr. Schaffer: We find that 10 per cent. loam will not hurt with us.

R. G. Eisenhart: I take it for granted that Mr. Frank is pretty well posted in the matter. I would like to ask him a question. We know but very little about the sand-lime brick in this country, it has been but a short time since it was introduced here. I am interested in this matter from the standpoint of a common brick manufacturer and I would ask Mr. Frank if he has ever known an instance in Germany, where the sand-lime system is said to flourish, where a common brick man had to go out of business on account of competition?

Mr. Frank: I do not know of any such instance. The sand-lime brick as a rule are not brought into competition with clay brick. In a district where you have clay, you haven't got sand. There are cases, of course, where you have competition. I know of one particular instance of recent date, being a very forcible illustration. In building some German barracks, the minister of war was called upon to defend himself, for he had selected sand-lime brick in preference to clay brick. It was discussed at some length in the *Thonendustrie Zeitung* and they erected sand-lime brick buildings. In that case the clay brick were worsted. It is my candid opinion that wherever the two come in competition that the sand-lime brick will be the victor. I do not believe as some sand-lime brick men do that you are going to be thrown into competition continually, but where the two come in competition I would decide in favor of the sand-lime brick. I would like to have the information I asked for, so it might not be lost sight of. I am very much interested in avoiding all that can be avoided in these matters. I am not alone in this, there are others interested. I believe the sand-lime brick men, may benefit by helping one another and knowing what to avoid is of most importance.

Mr. Ittner: I do not care to say anything on this subject, but I would like to say that Mr. Eisenhart's question to the gentleman I think was an unfair one, or at least inconsistent. If you expect any man in the brick business in this country to be run out of the business by anyone manufacturing this sand-lime brick, or any other article that comes in competition with our product, I think you are mistaken. I am confident that we have no such material in this organization. I want to say this to the sand-lime brick man, that before they run me out of business they will have to get up mighty early in the morning and go to bed mighty late at night. (Laughter and applause.) Of the subject itself I am entirely ignorant, but I want to speak of a composition material that I have seen used. I don't know whether sand and lime are the component parts or not, but I know they enter into it in a measure. In the city of St. Louis they have used these composition brick for streets. I think there was a certain amount of cement, or lime and broken concrete or granite in these brick, which lasted but a very short period and has gone out of existence. They used them for stepping stones around our city for carriages, but they have gone out of existence now, too. Naturally I notice all these compositions carefully. I live opposite Lafayette Park where they have large gate posts made of this material, one at each corner, and at each side; I think there are eight of them all told. They have been there in position at least twenty years and have stood an excellent test, but inroads have been made on them, and I do not know how much longer they will last. I do not know that we will be allowed to make any reference to the Children of Israel, but I know we have good brick from Egypt, made from two to three thousand years before the birth of Christ, that were made from clay and which are still good.

Mr. Frank: I would like to say in reply to the gentleman that we do not want to run him out of the clay business, but into the sand-lime business.

Mr. Ittner: That is generous of you.

Mr. Frank: The sand-lime men are familiar with just such sand-lime material such as Mr. Ittner has just spoken of. That material in every instance has turned out to be cement and sand and not sand and lime. I know of no case and there are many on record, where the sand and lime brick that have been properly made, have shown the slightest disintegration. On the contrary it grows harder from time to time. The clay brick men speak of the brick made in Egypt. It is strange to say that the cement aqueducts made centuries ago were the original causes for the sand-lime business. The Germans excavating in Rome struck this material of fearful hardness, it was taken to the German laboratories and very closely examined and was discovered that it was sand and lime and so began the sand-lime brick industry, so you see you are none the better off with your brick made in Egypt. (Laughter.) I wish Mr. DeLong would give me the information I am after.

S. E. Frank, New York City.

Chairman Blair: Mr. DeLong you are asked for some information, will you please respond.

Mr. DeLong: I hardly know what the gentleman refers to.

Mr. Frank: Mr. DeLong in reading his paper told of certain mistakes and certain things to be avoided. I think it would be of the utmost importance that we know what these mistakes are and so if Mr. DeLong can help us, he ought to do it.

Mr. DeLong: I refer to mistakes incident to the starting of any new factory. In starting new we always have a lot of new machinery and starting new works you run up against many difficulties which are unavoidable. That is all I had reference to.

Mr. Klein: I think I could probably give the brickmakers of the United States some little information on that subject, not from my own knowledge, but from an article that I read in the *Thonendustrie Zeitung*. As has been remarked here, the Germans find that the fuel for burning brick is very high. Coal is very scarce, and as necessity is the mother of invention, they have resorted to other means of producing brick. The cost of transportation in many parts of Germany is very high. From the tone of the article referred to it was the intention for the manufacturers of sand brick to supply these districts where coal and clay was scarce, but it was never their intention to hope to crowd the clay brick out of the market, where there was any clay or coal.

Chairman Blair: Are there any other persons here who make sand-lime brick who care to speak upon this subject.

Jno. L. Jackson, Saginaw, Mich.: I have been connected with the manufacture of sand-lime brick for about 14 months. We have made during that time about 5,000,000 brick. We have done a great deal of testing different sands and different limes. Some sand will make excellent brick with much less lime than others. It depends upon the lime. Ordinarily you can make very good brick with from 5 to 7 per cent. of lime. In some cases you have to use more. I believe our plant is the second in the United States to make brick. Mr. Oehlmacher of Michigan City, was the first. I investigated this thing very thoroughly, I spent six weeks in 1902 in Germany, Holland, France, Austria, and last year I made another trip abroad. I have always been in the manufacturing business and I gave the sand-lime brick matter as much investigation as I possibly could. I was skeptical. Being American born I didn't think we ever wanted to go over to Europe to get any of their ideas, but I changed my mind. In regard to the amount of heat it takes to melt a sand-lime brick, it depends entirely upon the quality of sand that goes into it, just the same as clay brick. Some clay brick will stand more heat than others. We have made some brick that have been subjected to a temperature of from 3,300 to 3,400 degrees and we have made others that have melted at a little over 2,000, and we have made brick, very good brick, too, with 18 and 20 per cent. of lime. That brick will absorb moisture. A brick that is made of coarse sand will absorb more moisture than brick made from fine sand. There is a great deal, gentlemen, to be learned on this question. I am here to get information. We are running a factory and it is a success and I extend an invitation to any member to go to Saginaw and see our pioneer factory. It is open to every one, whether competitors or not. (Applause.)

J. F. SMITH, Omaha, Neb.

Hervey Haigh: I have been in the paving brick business for the last ten or fifteen years and if I have got to go out of the brick business altogether, I would like to know if we can make paving brick by this process. If it will stand a degree of 3,300, it seems to me it ought to make it almost into glass.

Mr. Jackson: I investigated that part of it and I do not believe that sand-lime brick will stand for paving purposes. It may stand for sidewalks, but to come into competition with paving brick, I do not think the paving brick people need be afraid. (Laughter.) My neighbor here, Mr. Qualman, manufactures paving brick and I do not think he is afraid in the least.

A. D. Greenfield, Atlanta, Ga.: Mr. DeLong said that the sand-lime brick was a brick between a press and a common clay brick. If it is a fair question, I would like to know the average price of sand-lime brick—the selling price, the cost doesn't interest me. (Laughter.)

Mr. Jackson: As I have said, we have installed a number of plants and in order to get these brick into use we have had to meet the price of clay brick. In some instances we have had to meet the price of a very poor quality of clay brick. In other places it was not necessary, but when these brick get into general use, so the builders demand them, we can get from a $1.50 to $2.00 per thousand more without any trouble.

Geo. H. Campbell, Toronto, Can.: I am perhaps one of the youngest members of this Association, and perhaps the youngest brickmaker, in fact I may say I am not a brickmaker, but I have started during the past several months, this branch of the business—the sand-lime brick industry. I have spent three or four months constantly investigating this industry, at a great deal of expense, and if my opinion is worth anything, and I presume it is, since I have gone to all this trouble and expense, I must say that I have absolutely no doubt as to the future of the sand-lime brick industry. The cost of making these brick will vary according to the local conditions. The proximity of your factory to the sand bank, for instance. If you get your factory right up against the sand bank, you can of course make your brick cheaper. I know of a place where the brick were made for $2.50 a thousand. There is a factory in Montreal where they are making brick for $3.60 and they were selling them for $12 and they cannot fill all the orders they are receiving. As I said when I started I have had no experience, not even in the clay business, but I am here to study the business, especially from a mechanical point of view. My opinion is that it is not a question of secret process, it is a question of building best machinery possible and the proper handling of the material, to make it in its proper form. In conversation with a great many of the men here I find there are many doubting Thomases on this question among the clay men, but there have always been doubting Thomases everywhere. We all know Delisle was made to drink hemlock because he said the world was round; he is gone but the world is still revolving. This question is one of evolution and I have come to the conclusion that it is one with which we will have to reckon. I have gained a great deal of information, but I have found that instead of one there are five different machinery houses making special machinery. There are three or four new presses in course of construction to make these brick. I think you will find now it is a question of making the machinery to make these brick. When that question is settled, we will have as many sand-lime brick as we have clay brick. In talking with the clay brick men around the country, I have found this to be true. At the time dry press brick were brought into vogue they had just as much difficulty in introducing that new clay brick as the sand-lime brick men have to introduce their process, and I presume there is hardly a clay man that will now question the success of the dry press brick.

Mr. D. V. Purington: The next number on the programme is a little more general in character—"The Use of Brick." It does not say what kind of brick it may be. After this paper has been read, we may be able to discuss sand-lime brick and clay brick together. I suggest that we go on with the programme.

Chairman Blair: Now that Mr. Purington's mind is relieved in regard to sand-lime brick not taking the place of paving brick, I think we can proceed with the programme. (Laughter.)

Mr. Purington: My mind was not relieved today. It was relieved when the matter first came up. There has never been any question in my mind of their taking the place of paving brick. (Applause.)

Secretary Randall: I have a resolution which has been handed me to read.

Whereas, The express companies are charging unreasonable rates for the carriage of specimen brick; be it therefore

Resolved, That a committee be appointed by the Chair to confer with the officials of the various express companies and obtain, if possible, a more rational classification. The character of our shipments being such as to justify lower rates than now prevail.

Mr. Klein: I move the resolution be referred to the Committee on Resolutions.

Motion duly seconded and carried.

Secretary Randall: The next number on the programme is a paper on "The Use of Brick," by Wm. B. Ittner of St. Louis. Mr. Ittner himself is unable to be here, but he has sent his paper which I will read.

THE USE OF BRICK.

By Wm. B. Ittner, St. Louis, Mo.

In dealing with this subject it is my purpose to consider brick in its relation to architectural design rather than from its constructive uses.

I am sure we will all concede the fact that for wall and foundation there is nothing quite as good as well burned brick. It will withstand the ravages of the elements better than any now known building material; and its strength has been equal to all the requirements of modern or ancient times. Crushed or broken to the proper dimensions, it forms an aggregate for concrete floor construction, having every advantage over the material commonly used for this purpose. In fact I know of no material to equal it as a fire resister.

It seems useless, therefore, to discuss this phase of the question. I will accept these facts as a truism, and endeavor to show that brick has an equally valuable quality from the standpoint of the artist; and record my modest but sincere plea for its more intelligent and general use in this direction.

In these days of plenty and variety in the market of the building trades, for the exteriors or facings of our buildings, and the public demand for it, it is only natural that the architect is fast losing that cunning in the legitimate use of brick for exterior effect, which was characteristic of his brother practitioners of colonial days. Again, the introduction of the steel frame and concrete construction, necessitated through the demand of the present day, seem to be crowding brick from its most natural function—masonry wall construction—as well as to discourage its use for exterior effects.

The resources of this vast country with its storehouses of granite, marbles and building stones, gives the architect an excuse for variety and effect in some instances far beyond his ability to grasp; and the abuse of good material is evidenced in the facades or street fronts of most of our large cities.

The architect is not altogether to blame, however. The eternal striving for something new on the part of the owner, his desire to do something different and outshine his neighbors, must come in for its share of the blame. The final responsibility, however, must rest with the architect.

Then again there seems to have been a carefully planned conspiracy on the part of the brickmaker to give us a material so artificial and perfect, that it is almost a hopeless task to build a really beautiful wall.

These are to my mind, some of the principal reasons why brick has been steadily losing ground as a material of architectural expression, if I may be permitted to use the term.

I dare say there are still those among you who insist that brick should be of a uniform size and color; that its faces should be as smooth as polished glass, and its angles and edges just as sharp—a perfect brick, it is true, from the maker's standpoint, but does it give the architect the material which may be handled with any degree of success. To meet the demand for variety, the brickmakers have entered the field of color and molding. Brick are now obtainable in almost any desired shade; and, according to your catalogs, a variety of molded shapes can be obtained (until you actually need them) to please the heart of the most fastidious designer.

I know from experience that it is absolutely impossible to convince the brickmaker that there is any beauty in a plain red brick wall; yet, do we not all admire the beautiful brickwork of the mother country, and the early work in America executed under its influence?

An analysis of the brickwork of the continent shows that its prominent place in the decorative treatment of the buildings is due to the fact that, first of all, the brick are good and honest, being made of burnt clay. It matters not if in the burning they are slightly warped; it is natural that they should be; and why should they be exactly the same shade—will not some of them burn harder than others, even with the same fire. Is it not natural then that when laid into the wall with a perfect bond, the blending shades will produce the effects which we are trying so hard to obliterate.

In conclusion, my plea to you as the makers of the most honorable and ancient material with which it is our pleasure to deal, would be for less attention to molded shapes and colors; a closer study of size with reference to scale and bond, rather than uniformity in size or color; and for a material which is thoroughly honest in make, but not so good as to make the exterior of our buildings an uninteresting monotony. (Applause.)

D. V. Purington: I want to say that I know of nothing that any better indicates the feeling that prevails in this Association, than that the son of a brickmaker in his early days should come before this Association and give us such a paper as this, is simply an evidence of the evolution that is going on among the young men of our fraternity, and we may be very proud of it. It is an illustration of what I have felt coming for many years—that the coming generation would do us honor that we would be proud of.

W. O. Kutsche: I would like to say a word in regard to the size of brick. Should there be any difference regarding the size of sand-lime brick as compared with clay brick?

D. V. Purington: As one of the older members of this Convention, and one who remembers very many committees and reports we have had on this question, I want to say for the benefit of the gentleman, I think it is universally conceded that the length of the brick should be twice its width, leaving room for one mortar joint. As to the thickness of brick, I doubt if we can come to any conclusion that will be binding on the local brickmakers, but the relative length and the width are fixed.

Chairman Blair: I think that this is a thing that most local organizations endeavor to agree upon. Some manufacturers may imagine that they get a better price for a larger brick, but I doubt it.

J. Fred Smith: In regard to the paper I agree with the young man that a burned clay brick is the best for building. This meeting seemed to have run to sand-lime and concrete. I am a burner of clay brick and still have faith in the clay brick. One thing I regret in regard to prices, it has been demonstrated that there is a great profit in sand-lime brick. One man claimed a two-thirds profit. But where we are weak is the labor unions in laying the brick. We ought to go after the labor unions and see to it that the bricklayers do not get all the profit of a brick building. The beauty of the concrete is that they can use cheap labor to lay it up. You take a high-priced mechanic and a high-priced laborer to lay up your walls and it runs up the price of the building and the public lay it all to the brickmakers. The bricklayers don't allow any apprentices to go on a wall unless he be the son of a bricklayer. They are going too far with this thing altogether. I think this Convention ought to take some steps to see if we cannot compel them to have more apprentices in the bricklaying business.

W. B. Ittner, St. Louis, Mo.

W. S. Purington: I think we settled these things in our resolution on the labor question. We would be here discussing that matter until the 13th if we undertook to go into it, and since the Executive Committee settled it in such a satisfactory way, I think we should be content.

W. A. Eudaly: This Association is not in any sense, or in any serious sense at least, a legislative body. We are not here to legislate about any particular kind of brick or architecture, or method of running brick plants or the labor question, or anything of that sort. The great success of this Association lies in the good fellowship we have had all these years and our influence comes from the fact that we are an educational body, if I may be allowed to put it in that sense. We come here to get information about the best methods of running the manufacturing end of our business, and we have always adhered to that idea and I have no fear of any other matter coming in to distract us. Now this new question, the sand-lime brick has been very interesting indeed and we have been very glad to hear the sand-lime brick men. We have spent a great deal of time on the probability of how it may effect the red clay brick manufacturer, and it has been very interesting, but after all it is not really pertinent to the end we are here for. Let us drift back for a few moments to these papers which have been read and see if we cannot find anything in these papers that will aid us materially in the manufacturing end of our business. Every man here knows how to take care of the sale of his product. There have been very many valuable suggestions in this last paper. I was much pleased with it. It seems to call a halt on our drifting in to lines of manufacture that are not profitable. It calls a halt upon the many forms and degrees of variations we have been trying so hard to reach along the lines of brickmaking, and brings us back to our senses and gives us to understand the beauty of the brick is in the question of durability and strength, and I am very glad indeed to know that one of the charter members of our Association, an ex-president of this Association has the ability to produce a son that can write such a paper.

S. S. Kimbell, Chicago, Ill.

Secretary Randall: This brings us to report of Committee on exhibition of clay products at the St. Louis Exposition, by Prof. H. A. Wheeler, St. Louis, Mo. I would suggest that while the gentleman is adjusting his lantern to make the stereopticon views, that we take up the questions on this morning's programme. The first is question No. 7, "Is It Practical to Establish Standard Tests for Building Brick?" "If so, What Action Should be Taken by Our Asociation in the Matter?"

S. S. Kimbell, Chicago: I do not think there is any practical test that can be made. If there was a standard made for the building brick there would be lots of us going out of the business. The standard would be so high we could not reach it. While poor brick would be good for the backing of the wall, the brick to be used for facing would be entirely different brick, and we could not affix any standard. A man who wanted to put up a cheap building would not care anything about the standard and I do not think there can be any standard for building brick.

Secretary Randall: The next question, No. 8. "Under Favorable Conditions in the United States, What Should be the Cost of Sand-Lime Brick?"

Mr. Kutsche: Under favorable conditions with sand within 1,000 feet of your factory, lime at $4 a ton and coal at $3 a ton, a sand-lime brick can be made for $3 to $3.25 a thousand, and these brick sell in the ordinary market from $6 to $7 a thousand.

Mr. Hunt: Before we leave this question of sand-lime brick, I want to refer to what the gentleman said a while ago to the old Roman aqueducts, I would like to ask this question, whether it is not true that the scientific minds who have given years of study to the question do not agree that these conditions that obtain in Italy, obtain in no other places in the world. I believe it to be true that the scientific minds agree that the cement work that has been a mystery for generations is due to the peculiar volcanic salt that is found only in that section and if this is true is it not manifestly unfair to refer to these old Roman ruins as an evidence as to what can be accomplished with material that is obtainable in other countries and other sections of the globe. (Applause.)

Secretary Randall: The next question is along the same line. No. 9, "What Tests Should be Made to Determine the Fitness of Sand-Lime Brick for Building Purposes?" No. 10 dovetails right in with the rest, "Should the Specifications and Requirements for Sand-Lime Brick Differ From Those for Ordinary Brick and in What Particular?"

P. J. Connell, Holton, Mich.: May I ask the gentleman who gave the approximate price of sand-lime brick on what he based his estimate on the cost of labor.

Mr. Kutsche: A dollar and a half for common labor.

Mr. Connell: If we have the approximate figures, each man can figure it out for himself.

W. S. Purington: I would like to ask Mr. Kutsche when he gave the cost of sand-lime brick, whether he took into consideration everything including the interest on his plant, wear and tear and all that sort of thing.

Mr. Kutsche: No, I did not.

Mr. Purington: Well, if we didn't consider those things we could produce clay brick just as cheap as that.

Mr. Kutsche: I did not take the interest into consideration, or the cost of selling, or anything of that sort.

Secretary Randall: There are some unanswered questions on yesterday's programme and we can probably go through them before Prof. Wheeler is ready. The first is question No. 14, "What is the Best Construction for an Exhaust Steam Hot Floor Dryer?" Is there any gentleman in the room who has built and is operating such a dryer?

Fred Talbott, St. Louis: In the factory of the Laclede Fire Brick Co., St. Louis, I have a system of using exhaust steam for drying. We put in a lot of sewer pipe and run a bulkhead of brick for heating the ground floor and it is so arranged that at night we can turn in live steam and heat the building and we get that building very hot. It is a simple construction, about the best thing I know of in the way of using exhaust steam.

Mr. Eggers: What is the size of your exhaust pipe?

Mr. Talbott: All sizes, from two to eight inches.

Mr. Eggers: I mean the main pipe.

Mr. Talbott: The pipe from the engine is eight inches.

Secretary Randall: The next is a question coming from a man looking for information. No. 15, "Can the Manufacture of Paving Brick be Made Profitable in a Granite Country; or in other words, is the Best Quality of Brick Paving More Economical than Granite in a Granite Country?"

W. S. Purington: I say yes.

J. W. Sibley: I would like to answer that question by saying that during the past ten years we have been shipping paving brick 175 miles to Atlanta, Ga., and they have a stone mountain within 16 miles of the town.

Secretary Randall: No. 16 reads, "Is it a Paying Proposition to Use Exhaust Steam in Drying Brick Made from Clay that will Stand a High Initial Heat, Particularly When a High Maximum Heat is Desired?"

Mr. Klein: Yes.

Mr. Haigh: In answer to this question from my experience, I should say no, for the reason that there are few plants that have exhaust steam for the night the same as the day. And when one is used at one time and the other at another, there is in some cases a varying degree of heat, especially as this is put through stationary pipes in each tunnel in the dryer. We have never been able to get the same degree of heat from the exhaust that we could get from the live steam. If the fan system is used, meaning by this that the exhaust is conducted to one point and through a coil of pipes, it can be arranged sometimes to use along with it the waste heat from the kilns. If there is not sufficient heat in these two, it would pay to have an auxiliary furnace to help out at times. It does not pay to cut the capacity of a plant down, in order to save a few cents per thousand in drying.

Secretary Randall: The next question, No. 17, reads as follows: "Is the Waste Heat System Capable of Close Enough Regulation to Successfully Dry Brick Made from a Tender Clay—a Clay, for instance, that Will Check if Subjected to Much More than Normal Summer Heat to Start With?"

Mr. Eisenhart: Get another clay bank.

Mr. C. H. Carpenter, Martins Ferry: It is safe and capable of close regulation if you watch it.

Mr. Haigh: This question it would seem to me, calls for two answers, or rather it would be more explicit to answer it that way. The first, can the heat be regulated? Second, will it dry the tender clay after it is regulated?

To the first part of the question. After several years of practical experience with waste heat drying, we find that it can be regulated to almost any desired degree and held at a given point with very ordinary care almost indefinitely, if you have sufficient heat to do it with.

Now as to the second question. I am inclined to think it will successfully dry a most tender clay, but before saying definitely that it will do this, I would ask for more information, as it is best to be very careful in a matter of this kind. Some clays will check in a very light breeze. Indeed, I have in mind a plant that I superintended the construction of and operated for three years, where the brick they claimed could not be dried successfully in a dryer, other yards had tried it in the same vicinity, so that at this plant the old method was employed of drying the brick on what they called the "hack" system, or outside system. It took a space of nearly forty acres for a plant with a capacity of 40,000 per day, and even with all this the brick each had twenty holes in them, and when first put out, three high, side covers had to be put up if there was any breeze at all, to keep them from checking. To be able to answer this question and advise in an important matter of this kind, it would seem to me we ought to know the length and general construction of the dryer, and the distance the heat has to be drawn before put in the same, because the further this has to be drawn the stronger the draft, and consequently the greater pressure in the dryer, which should be regulated to the requirements of that one particular material.

Secretary Randall: The next and last question, No. 18, reads, "For How Small a Plant is it Practical to Use the Waste Heat System of Drying?"

Mr. Sibley: The smallest plant in which we use it in Virginia has a capacity of 20,000 per day.

Mr. Bloomfield: I know a plant in New Jersey that has three small kilns and they are using it profitably.

W. P. Blair: I would say that if a man has one kiln he had better use that waste heat to the extent that he has waste heat.

Mr. Haigh: This question is short, but it asks a great deal. I would like to know what degree of heat they require to dry this material now. And for the grade of brick they want to dry?

The reasons for my growing my hair longer on one side of my head than the other, are three: First, to cover the bare spot you can see; and second, to please the good little woman I left at home this time; and third, so I won't look past the age limit when I want another position, if I do. The cause of that bare spot and the few grey hairs on each side of the face, I think, were caused in a great measure in trying to keep steam pipes from leaking in a dryer, which, on account of there being no room for it, was built on soft ground and kept continually settling in places, after being built, causing the leakage.

I doubt if any one can answer this question with the information on hand at present. If they should have down-draft or continuous kilns, I think no matter how small the capacity, it would pay to utilize their waste heat. If the plant is so arranged that when this is used up, they can have a furnace built outside in which they can make heat to keep the dryer going or if the smoke and gases would not discolor the brick, I would use what little there was in coming from the boilers and after water-smoke is off the burning kiln, use all the heat that comes from that. Now our experience has been that a kiln with 140,000 brick in it will furnish two 160-blowers with 200 degrees of heat for three days in a 24-track dryer. And how much longer a lower degree, say 100 degrees, we never tested, for the reason that in ten kilns we could easily dry 120,000 paving brick per day, and had heat to spare, and when one kiln got below 200 degrees we would leave it and take on another. So that is a question rather difficult to answer, unless we know more about the existing conditions on the plant. For instance, the distance this waste heat has to travel before it gets to the dryer, and whether or not everything that comes from the kiln can be used. From the experience I have had with steam piping caused mainly by the soft ground the dryer was constructed upon, and the success we have had with waste heat drying, if the plant was mine I should endeavor to use what I could of waste heat, even if the capacity was only 10,000 per day.

Hervey Haigh, Catskill, N. Y.

Secretary Randall: This completes the list of questions. If the parties asking these questions have not received the information they wanted, let the fact be known, they can have the floor and then they will probably get it. If Prof. Wheeler is now ready we will hear his report.

REPORT OF THE WORLD'S FAIR EXHIBIT COMMITTEE.

By Prof. H. A. Wheeler, St. Louis, Mo.

Gentlemen of the Convention:

The committee appointed by you to advise and aid the St. Louis World's Fair in securing a representation of a clay industry of this country in harmony with its importance and development, beg to submit the following report. A meeting was held by the committee on May 1st, 1903, in the Administration Building of the

World's Fair of St. Louis, during the dedication ceremonies of this stupendous enterprise, which was attended by Messrs. Middleton, Randall, Ashby, Royce and Wheeler. There were also present by invitations Dr. J. A. Holmes, the Chief of the Mining Building, in which the collective clay industry exhibit will be held, and W. P. Blair of Terre Haute, in the interest of the paving brick industry. Dr. Holmes stated that while the official classification of the World's Fair also admitted clay products in the departments of Fine Arts, Liberal Arts, Manufactures, Electricity, Transportation, Agriculture, and Horticulture, the Mining Department was the only one where the complete clay industry could be shown from the raw material, through the processes of manufacture, by the intermediate machines, dryers and kilns, to the perfected and finished product. He emphasized that it required the finished products to develop and bring out the true value of raw clays. He stated that about 20,000 sq. feet had been allotted to the clay industry at the eastern end of the Mining Building, immediately opposite the Government Building, which he regarded as one of the finest sites on the grounds. Dr. Holmes also stated that every exhibitor in the collective clay industry exhibit would be given full credit in the matter of awards, in harmony with the value of the exhibit.

Mr. Blair stated, in behalf of several prominent paving brick manufacturers, that it would be a mistake to lay the aisles of the exhibit with paving brick, as originally contemplated. For it would be laid on a board flooring, which would shrink and settle unevenly, and thus produce cracks in the pavement that would do great harm to the industry because of such a poor foundation. When the committee was further informed that this entire building was built on piling that would not permit the necessary rolling with a five-ton roller, it was decided to recommend the abandonment of paving brick for the aisle.

As the pottery kiln design for the central imposing feature of the exhibit as proposed by the architects, had been seriously objected to by the press brick manufacturers, from the poor opportunity it would give to show variety in color and design in press brick work, several substitutes were proposed, and the final design was left in the hands of Prof. Wheeler.

PROF. H. A. WHEELER, St. Louis, Mo.

After being entertained at the press banquet by Dr. Holmes, the committee adjourned, and were not able to again meet until this Wednesday in Cincinnati, when every member was present, except Mr. Ashby.

The aims and objects of the committee have been vigorously pushed by its chairman, as his residence in St. Louis permitted the building up of intimate relations with the Exposition officials. He was successful in getting them to not only practically adopt the general plans as developed and outlined at the Boston meeting, but to so energetically push the project by sending your chairman on the road to call on the clayworkers and enlist their co-operation for good exhibits. The result is that today the 20,000 sq. feet is more than applied for by leading representatives in all departments of the clay industry, as over 60 applications have been received for space. There will be beautiful collections of art pottery, fine lines of table and sanitary ware, complete exhibits of stone ware, gems in encaustic and art tiling, masterpieces in terra cotta, magnificent exhibits in press and enamel brick, good representations in common and paving brick, very complete lines of fire brick and refractory goods, roofing tile in attractive form, and a fine exhibit of the infant sand-lime brick industry. Most interesting to the clayworker, and to much of the intelligent, thoughtful public, the crude, raw clays, from which these are produced, will be well represented, together with models of machinery and kilns by which it is done, and accompanied by large photographs of the leading plants of this country. Some changes have been found necessary in the plans and the pottery kiln has been replaced by a most imposing pavilion in press brick, and the central obelisk has been given way to a masterpiece in terra cotta in the shape of a large pagoda. As the lighting was found to be from the roof, on completion of the building, as the loggia interferes with the side light, it has been necessary to abandon the tile roofs over the alcoves, which was also more satisfactory to the tile makers.

This Association, through its Secretary, has applied for 170 sq. feet of space that will be used as headquarters for its members, and where a complete exhibit will be made of brick from all over the world.

There are a few representative manufacturers still absent, and a further effort will be made to interest them, as there yet remains three months before the Exposition opens. For with a fine series of representative exhibits now assured, it would be a great misfortune to leave any gaps, and a still greater mistake for any prominent manufacturer to lose this glorious opportunity of exhibiting his goods in the clay center of the largest, finest and what promises to be the most successful international Exposition ever held.

For beauty and grandeur the St. Louis World's Fair is in harmony with its stupendous size and enormous cost. Its 1240 acres exceeds the combined area of the Chicago, Philadelphia, and Paris Expositions, while over fifty million dollars will have been expended by opening day.

As Dr. Holmes is struggling with the problem that confronts the chiefs of the twelve other departments in trying to locate applicants requiring 30 acres of space in a building that only has about 10 acres, especially as nearly every one is insistent that his exhibit is entitled to the best corner, he has found it impossible to attend to the fund derived from the charge of 30 cents per sq. foot that exhibitors will pay in the clay industry exhibit. He requested the chairman of your committee to receive and disburse this fund and a finance committee, consisting of the Secretary of this Association or T. A. Randall the Secretary of the American Ceramic Society, or Prof Edward Orton and a representative of Dr. Holmes' department, or V. C. Heiks, was appointed to supervise its proper distribution.

This fund is to provide for a general superintendent to care for and clean the exhibits during the seven months of the Exposition, and to meet the architects' fees for designing and superintending the erection of the salient features of the exhibit. It is not for installing the exhibits, which, as usual, is an expense that each exhibitor must meet.

An advisory committee was also appointed by Dr. Holmes, to insure representation of the white-ware, art-tile and pottery branches of the clay industry, that will co-operate with the N. B. M. A. committee.

As the floor load of this building is 200 pounds per sq. foot, it is very important for exhibitors to promptly put in their special foundations where their exhibits will exceed this limit, or cannot be brought down to an average of 200 pounds by means of platforms or other devices for distributing the weight over a large area.

The only complaint that visitors to the Exposition have made is that they fear the hotel accommodations will be inadequate to provide for the enormous crowds that are now assured.

It is with pleasure that the report can be made that there are now enough new hotels completed or under construction, together with a large number of private houses that will rent rooms, as to comfortably take care of all visitors.

Of the twenty-one principal buildings of the Exposition, all but four are entirely completed and ready for the installation of exhibits and another month will be sufficient for their completion. The series of beautiful State buildings on the plateau of States, adjoining the clay industry exhibit, are most completed, while the foreign government buildings are either finished or far advanced with one or two unimportant exceptions. The landscape gardening made such excellent progress before severe weather set in three weeks ago, as to assure its completion by opening day. There is therefore no question about the St. Louis World's Fair not only opening April 30th on time, but being in most complete and attractive condition, if exhibitors will now push their work and complete their installation by opening day or April 30, 1904. (Applause.)

At the conclusion of his report, Prof. Wheeler gave an illustrated lecture, showing with stereopticon, views of the World's Fair grounds and buildings, which gave the listeners a most comprehensive idea of the extent and beauty of the Exposition, and for which he was tendered a vote of thanks.

Chairman Blair: We are certainly indebted to Mr. Wheeler for this very interesting and instructive entertainment. It will make us all more than ever anxious to visit the Exposition, which evidently will be the greatest exhibition of the kind the world has ever seen.

On motion the session adjourned.

FIFTH SESSION.

Friday Afternoon, February 5, 1904.

President Purington: Gentlemen, we will once more resume business. The Secretary will announce the first paper on the programme.

Secretary Randall: The first number this afternoon is a paper "The Financial End of the Brick Business," by Phil J. Hodgman, Wheeling, W. Va. Mr. Hodgman is not here but he has sent his paper, which I will read for him.

THE FINANCIAL END OF THE BRICK BUSINESS.

By Phil. J. Hodgman, Wheeling, W. Va.

Gentlemen of the Convention:

Among the earliest works of civilized men have been found records of commercial transactions that have been preserved through the ages by inscriptions on imperishable brick and stone.

Old as the science of accounting has been found to be it is still but imperfectly applied by many business men, sometimes through negligence, or ignorance of methods, but oftener because the importance of keeping an accurate record of all business affairs is underestimated.

A seasoned navigator would not think of embarking on an unknown stormy sea, without a compass to guide his wandering boat or a rudder to control it.

No business man who hopes for success should undertake to manage his store or factory without a comprehensive system for operating his plant and keeping the records of his office.

It is probable that no class of manufacturers suffer more seriously from negligently kept books and estimates of cost than the clayworkers. With us losses are so insidious, and, at the same time so utterly beyond recovery, that the most serious inroads are often made in the profits we have expected to find at the end of the season; the little leaks having emptied the pot of gold before we arrive at the end of the rainbow.

This experience is disheartening and disheartening experiences compel thought; the immediate impression is that something is wrong; no doubt about it! But what is it? Lack of system, to be sure! For with thorough system such a result would be impossible.

System applied to the factory enables us to eliminate waste, it cheapens cost of production, stimulates efficiency, improves the quality of the product and makes it possible to secure for it the highest market price.

Applied to the office it gives accurate records of the costs of our labor, fuel and supplies and keeps us informed as to the extent of our expense accounts, salaries, interest charges, taxes, repairs, insurance, etc., as well as the relation of those charges to our production.

That the financial success of a business is intimately connected with its economical and systematic management "goes without saying." To have such management we must be in touch constantly with every detail of our work.

Our factory foreman must be competent and to secure such a man a salary should be paid according to his merit and capacity. Cheap foremen are often the antithesis of economy.

The foreman should make a daily report of the product and the ware set for firing, the shipments and amount of ware put into stock. He should report the contents of each kiln as set and the amount of ware drawn from each after burning and should keep an account of the fuel and labor used in burning, designating the kilns by numbers and the amount of fuel used for steam and for drying the ware.

The foreman should have a separate report for supplies received, to facilitate the checking of invoices and fuel accounts.

For convenience in arriving at accurate estimates of cost the pay rolls should end on the 15th and 30th of the month and should be payable one week later. This arrangement will make it possible to show accurately the amount of labor chargeable to the product for the month and will allow time for the paymaster to make up his accounts.

Experience has made it clear that the brick business, to succeed, should be done on a strictly cash basis; bills for supplies, fuel, etc., should be paid on the 10th of each month, or at such other early date as will best suit prevailing conditions, in order that the monthly expenses may be shown and distributed.

The principal expense accounts, that is to say, those most important in affecting cost of estimates, may be said to be labor, fuel and running expenses. Under the latter head should be charged repairs, renewals, oils, powder, stable expenses, belting, tools and all expenses for the maintenance of the operating department.

Following these accounts and next in importance as affecting cost are general expense, salaries, interest, and insurance, with these groups the necessary expense accounts for the business may be very well covered.

To salary account should be charged all expenses for office help and all labor of head or hand not covered by the regular pay roll.

To general expense all office supplies, postage, taxes, expressage on samples, in short, any expenses that are not properly chargeable to running expense account.

Brick account should be credited with the total sales for each month and should be charged with freights, when allowed, and also with any allowances in settlements with customers or other items by which the invoice price shown on the sales book has been reduced. The net amount so obtained divided by the number sold will give the average selling price.

The sum of the footings of the expense accounts divided by the number of brick made up to the end of any period at which an estimate may be required will give the average cost.

Enough brick should be made in excess of the number reported by the factory, each day, to cover loss from breakage of green ware and if this is not done an allowance should be made for each loss in estimating cost.

The cost of burning is made from the foreman's reports with a proper amount added to the totals for unburnt ware.

Interest on invested capital and depreciation of plant and real estate should be taken into account when fixing the selling price which should be based on a fair return to the owners and once fixed should be rigidly adhered to and concessions made only in extreme cases or to meet legitimate competition.

Terms should be net cash and all accounts should mature at the end of each month, with an allowance of ten days grace, except in cases where special terms are required to meet unusual conditions.

An experience of more than a decade as a brickmaker has convinced me that an equal amount of system, energy and common sense, applied to the brick business, will give results equal to or beyond the average for most lines of staple manufactures.

Natural conditions should guide investment in brickmaking; failures are inevitable for those who neglect this rule and to its neglect is chargeable the wreck of many hopes and fortunes.

PHIL J. HODGMAN, Wheeling, W. Va.

To locate a plant of 30 or 50 thousand daily capacity where the normal market would require but half that amount of ware, or, in territory already fully occupied means loss of invested capital as surely as voluntary starvation means suicide.

Ninety per cent of those who take up business as an occupation fail. Why is this so? To answer the question in detail the world itself would be taxed to contain the data. It may be safely affirmed, however, that reduced to the last analysis, the road to financial success is paved with the rugged virtues of caution, prudence, patience, order, painstaking care and persistent hard work.

He who would win must bring to his aid fitness for his chosen work, determination to do it better than his competitors, a willingness to serve and ability to command. (Applause.)

General Discussion.

President Purington: I would like to have Dr. Alderman lead in this discussion. He has had a great deal of experience and I would like to hear from him.

Dr. Alderman:, Athens, O.: I am not a brickmaker and possibly more unfit for remarks on this subject than anyone present. I appreciate the importance of that paper. It is well read and well written. I do not think any business can be successful without proper economical management, and I think there has got to be a system about it. I do not think any business is sufficiently able to run itself. Proper management and economical management are certainly important factors in any business, but of course there are so many different and varied conditions the country over that no set of rules can be applied to all. So far as the paper itself is concerned, I would not undertake to discuss it. It is an ably written article.

President Purington: I would like to hear from Mr. J. R. Copeland of Birmingham, Ala.

J. R. Copeland: I did not hear the entire reading of the paper, I regret to say. I am like every other brickmaker, I am interested specially along that line, and if there is any one thing that we brickmakers of the South should be posted on, and that we would like to be posted on, in my opinion, it is on the cost of production, and I know many of them are not posted. I do not say this boastingly, but it is a habit of our people in the South not to go into the details of their business. They do not count the interest and all those little things. I heard the question as to cost of brick asked of one of the sand-lime brick men this morning, and he gave you some figures which did not include the interest on his plant, the capital invested, etc. How can we as business men fail to include all these items of expense in our costs? How can we as business men sell an article at what we consider a fair living profit if we do not know what it costs. Why should we not count our interest on our money invested, our insurance, and everything that goes to make up the cost of the brick. Why should not a man who is capable of accumulating enough money to build a plant be entitled to a fair salary. Why should he not count his salary at a good fair remuneration, and if we should do that, in many cases we would know more nearly the cost of production. I think it is one of the greatest mistakes we make in not knowing our business more thoroughly, and I want to say since I have been attending these conventions I have received lots of good from the talks, not only along these lines, but many other lines. While there are a few little jealousies that will occasionally crop out, yet I am glad that this Association looks at these things from a liberal point of view, and let us keep this up and not go into little personalities, of this man's troubles and the other man's troubles; get up on a high level, as was remarked by Mr. Ittner's son in his paper this morning. How proud we ought to be that we will have boys that will come along as Mr. Ittner's son has, and lift up the business.

Chas. Burridge, Tecumseh, Mich.

President Purington: There is one modern innovation we have introduced in our office, and that is the card system. We have practically eliminated everything in the way of bound books from our business and taken up this card system, and we have found it satisfactory beyond our greatest expectations. If there is no one else desiring to discuss this subject, we will take up the next.

Secretary Randall: The next is a paper by a fellow townsman of Mr. Copeland, Mr. H. J. Matthews, on "The Manufacture of Brick from Southern Shales." Mr. Matthews intended to come, but has been detained. However, he has sent his paper, which I will read for him.

THE MANUFACTURE OF BRICK FROM SOUTHERN SHALES.

By H. J. Matthews, Birmingham, Ala.

Gentlemen of the Convention:

It is gratifying to know that the manufacture of brick from Southern Shales have kept pace with the progress of Birmingham and the Birmingham district, of whose product and industry I shall confine my remarks. That you gentlemen may know that I come from "Way down South," from a locality where a single kiln or two of brick will not suffice to meet the demands, I want to present a few figures which tell of the marvelous development of the Birmingham district in the last twelve months. The figures will tell but one story, and that of the surpassing progress and prosperity which reflects in a hundred ways on the brick industry. In the establishment of new and important enterprises, in the erection of massive buildings, in the increased output of our mines and manufactories and in many other ways.

Some idea of the growth of the district may be gathered from the following statements: Our clay products for the year just closed amounted to $894,000, which is 94 per cent. of the total clay products of the State of Alabama in 1901. Our coal production from 10,329,000 to 11,679,000 tons—a gain of 1,350,000 tons. Our pig iron from 1,492,211 tons to 1,561,398 tons — a gain of 69,187 tons. Our coke from 2,210,735 tons to 2,658,185 tons — an increase of 447,450 tons. Our cars handled from 479,769 to 615,937—an increase of 118,168 cars. All this was done in a teritory embracing what is known as the Birmingham district, containing something like 90,000 people. The labor pay rolls amount to $3,500,000 per month. Last year 137 companies were incorporated, and in the same period the sum of $6,113,643 was spent in improvement. New houses built in Birmingham and its environs number 2,048 and cost $4,269,975.

The demand for shale brick is met by four plants located in our immediate district and the same process of manufacture is followed by all. In addition to the shale plants we have some five or six companies manufacturing from common clay. In point of quality and the small loss of handling, shale brick take precedence over all, in our market.

What are the potentialities of this great resource of the State of Alabama. Its geographical situation and commercial outlook with reference to Mexican and Cuban ports is of utmost importance to this industry. The cities on the Gulf coast have begun to demand an impervious brick for building, which will cause an increasing amount of brick absorbing from 2 to 9 per cent of moisture. Our export trade in shale brick is not an extent or character to call for much notice at present, but from indications, we hope to be able to develop an increased demand. The shales of Birmingham district are carboniferous shales lying over the coal measures and forming mountains of this strata, rising clean and clear to a height of over 100 feet.

At the Graves plant, which I will take for example, for the reason that I am connected with the same, are two beds of shale, one over the other, viz: a yellow sandy shale and a gray one containing much less grit. Both were treated physically and the results of these tests will be given you. The yellow shale contains a high percentage of ferric oxide and fuses very easily, while the gray contains several per cent. less and is much better adapted to the manufacture of vitrified wares. The composition and physical characters of the two are given side by side for the purpose of comparison. Light or gray shale: Plasticity quite good. The shale takes 25 per cent. of water to work it up. Air shrinkage 2 per cent. Shrinkage at 2,000, F., 9 per cent. Brick good color, not very porous. Fusion at 2,500, F. Dark or yellow shale: Plasticity moderate, shale gritty, requires 20 per cent. of water to work it up. Air shrinkage 1½ per cent. Shrinkage at 2,000 F., 5 per cent. Brick good red color, somewhat porous. Shrinkage at 2,150 F., 6½ per cent. Brick nearly dense, reddishh brown. At 2,250 F., nearly vitrified. Fusion at 2,500 F. The tensile strength of the air-dried briquettes before burning, average 105 pounds, minimum 85 pounds per square inch.

ANALYSIS GRAVES SHALE.

Silica	57.80	61.55
Alumina	25.00	20.25
Ferric Oxide	4.00	7 23
Lime	2.10	trace
Magnesia	.80	.98
Ignition	7.50	6.19
Alkalies	1.80	2.25
	99.00	98.46
Total fluxes	8.70	8.45
Specific gravity	2.12	2.23

The gray shale burns to a denser, harder body than the yellow, and does not blister as easily in burning owing to its lower percentage of iron. It is blasted out with some regard to mixing, about half and half, and conveyed to the factories by gravity planes or by hoisting drum to the sheds and dry pans and there ground. No other preparation is necessary.

It is then elevated to the top of the building and run over approved clay screens. The fine powder is delivered to the pug mills, of which there are two for each machine. The shale is worked very stiff and the column 4 3-16 by 8 5-8, cut by automatic side-cut table. In the Graves plant the cutting table is arranged to cut seven common brick 2½ inches each, and six blocks 3 27-32 inches, the common being hacked on cars from one side of conveyor belt and the blocks taken from the opposite side and repressed. By this process we are enabled to turn out two kinds of brick, without disturbing the discipline or organization of the force. Further, by cutting the blocks in this shape, 8 5-8 by 4 3-16 by 3 27-32, and feeding the same to the repress edgewise to the structure, to mold boxes, 9⅝ by 4⅝ by 3¼, the original bond is broken and an entirely new structure is made, destroying all lamination.

The brick are dried in steam dryers. The common set 42 high in up-draft, and the pavers in down-draft kilns. The firing is done with bituminous coal, mined on the property, a stone's throw from the kilns. Twelve days are required to water-smoke and to burn the up-draft kilns, containing 500,000 brick, consuming from one-half to two-thirds tons per 1,000 brick. The pavers are vitrified in seven and eight days and consume an average of one-half ton of coal to 1,000 blocks. (Applause.)

President Purington: If there is no discussion on this paper, we will take up the next.

Secretary Randall: The next is a paper on "Manufacture of Salt Glaze Brick," by Isaac Hardy, Worksop, England. Most of our older members will remember Mr. Hardy as one of the faithful members of the Association. He was at one time connected with the great Tiffany Enameled Brick Co., at Momence, Ill. He went to England, his native land, some years ago, and his son now has charge of the plant at Momence. Every year when Convention time comes, he sends us a paper on some theme showing that he still retains his love for and interest in the Association, though he cannot meet with us.

A PROBLEM IN SALT GLAZING.

By Isaac Hardy, Worksop, England.

I am reminded in my distant home that the time has come around again for the holding of the Annual Convention of our Association. It is now about fourteen years since I first made the acquaintance of THE CLAY-WORKER, the official organ of our Association. Since then it has been my privilege to attend some of the annual gatherings, they are to me a pleasant recollection, as I look upon them.

I think no man can look back and trace up the history of this Association without being struck with the fact, that these annual gatherings have not only contributed to our pleasures, but they have been helpful in many ways. Many problems have been solved and many doubts and difficulties removed, by an exchange of views, resulting in wider experiences, which enables men to more intelligently handle the various topics and questions, which come up for discussion and examination from year to year. Every one, I think, will agree with me, in that the knowledge gained in the manufacture of brick, is far more advanced than it was some years ago, principally owing, I think, to the light and leading of this Association. But sir, all the problems are not yet solved, neither are all the difficulties removed. Some of them still remain with us, and every succeeding year brings with it its batch of questions to be answered and new topics for examination and discussion.

In looking back to questions proposed and the debates thereon, the answers given, the suggestions made and the warnings or danger signals held aloft at Boston last year, we may safely say that the problems met with in the brick trade will not grow less. There will always be enough left over to keep the brain of the brickmaker busy. His is a wonderful business, he never knows just where he stands. But let us take courage, we are on the up grade. I have often noticed, sir, that questions which some would think to be of great importance, receive but little attention. As quickly as they are brought forward, just as quickly are they laid aside, but they do not die there. The good we do lives after us, and it has been our experience that those questions which receive the least attention inside the convention, receive greater consideration on the outside. It was my privilege to send a paper on salt glazing, to be read before your honorable assembly last year at Boston. This paper found its way into several trade journals in your country, and by this means was circulated throughout the United States and Canada, and also in England. It brought me considerable correspondence from each of these countries. One would think that the subject was treated so exhaustively that there was no room for comment, but if so, you are mistaken. That article contained information sufficient to enable any ordinary man with the right kind of material at his command to glaze ware with salt, but the information ended there.

There are problems connected with this business, which lie beyond the point, and which that information can not solve, and which no ordinary experience can successfully handle. It is one of these problems which I wish to bring before you today. There is a company in a Western State organized to make salt-glazed ware, but they met with little success. They saw a reprint of my article written last year. They at once put in operation the method set forth in the article with the most pleasing results, up to a certain point. When their kiln was finished, the ware, as indicated by the trial pieces, had on it a beautiful bright glaze. But their joy was soon turned to sorrow, for when the ware was drawn, there was not the least glaze upon it. They sent me two of the trial pieces and I send them to you, gentlemen, for your inspection. They represent their point of success and of failure.

This is not an isolated case, there are many of them and any light which can be thrown on this problem will, I am sure, be gratefully accepted by those who are in this trouble. I think there are those here today who are well able to give a scientific explanation of this perplexing phenomena. I can but give my own opinion from practical experience.

The clay from which these trial pieces were made, I should presume, contains a large amount of iron distributed in small particles through the body. It has none of the constituents of a fire clay, and it therefore vitrifies at a low temperature. It is at this point in a suitable condition to take the glaze, but the temperature is not high enough to flux the iron, only to calcine it. At the finishing heat, this iron is hermetically sealed by the glaze and when drawn from the kiln at this point it suddenly cools and remains in the bright smooth condition you see in piece No. 1. Piece No. 2 was drawn from the same kiln some 14 hours after the kiln was considerably cooled and represents the ware at that time.

The question I wish to ask is this: "What is the cause of this altered condition of the ware?" My own opinion as to the cause is this. The iron only being calcined, immediately the ware begins to cool, it begins to expand and bursts through the glaze, at the same time setting free the sulphur it contains, thus further acting on the glaze, completing its destruction and reducing it to the condition you see in trial No. 2.

ISAAC HARDY, Worksop, England.

The second question: "Can salt glaze ware be made from this clay?" I would not say it cannot, for I am a strong believer in Mr. Fiske's doctrine, that first experiments are not always successful, and it goes forth that it cannot be done. However, by and by another man comes along and makes a success of it. One thing is certain in the manufacture of salt-glaze ware, there is not that latitude to vary the process to suit the varied nature and constituents of the clay, as there is in brickmaking. You have one agent to work with and only one, and that is salt, and if nature has not provided the constituent in the clay which will combine with the sodium in a preponderating degree, then it is my opinion that salt glaze ware cannot be made on the lines of my paper of last year. Taking this for granted then, if salt-glaze ware is to be made on other lines, some further knowledge is needed. In many places in the United States there is clay that will stand all the fire needed for salt-glaze and still not be rich in the constituents necessary to form the combination with the sodium, resulting in the fine finish so much desired. Or there may be other elements present in large proportion which dominate the whole and make void the fine glaze that may be on the ware at finishing heat. Where this is the case this method may be adopted. There are clays to be found which will flux into a fine natural glaze without the use of salt. This could be used as a slip in which to dip the ware, or there is clay which has in it just the right natural elements for salt-glazing. This could be used as a dip. The ware in this case could be produced in all other respects by following the instructions given in my paper last year. But where neither of these clays are available an artificial mixture can be made that is in all points suitable for salt-glazing, and which will take a beautiful glaze. I know you will be thinking of the cost. This method would add a little to the cost but not so much as at first one might think. It would also add in some measure to the inconvenience of manufacture, especially in treating large sizes of pipes, anything, say larger than a 12-inch pipe, but it would add considerably to the beauty and utility of the ware. Whether one cent a foot more could be obtained for these goods I do not know, I must leave that to be decided by the manufacturer. I am inclined to say that utility and high art in manufacture are not conducive to sales, unless the prices are way down among the common things.

Salt-glaze goods are not made in this country (at least not these coarse, heavy goods), but by the process I have sketched above many salt-glaze brick are made by this dip process. The dips are colored with metallic oxides and many beautiful colors are produced, rivalling enameled brick and prefered to them for many purposes.

In closing permit me to remind you that this is a process of doctoring the clay, which our friend Mr. Yates says is not reliable. In this case I quite disagree with him. Many beautiful and reliable things are made from doctored clays, which never could be made without it. However that may be, science may have something to advance that may solve the question I have laid before you today, and I feel quite sure that an expression of scientific opinion from Professor Orton and some of his colleagues would be very much appreciated by many who are engaged in the business. (Applause.)

President Purington: Is there any one here who desires to speak on this question. Do you salt glaze, Mr. Crook?

Mr. Crook: I have had no experience in that line. I would like to hear from some of the members of the Ceramic Society on this subject, for it is a great field. There was a paper read before the Association a few years ago on this same subject that was very interesting.

G. C. McNeil, St. Louis, Mo.

President Purington: We have a paper that was passed over on the programme yesterday, because the author, Mr. Gunn, the City Engineer of Covington, Ky., was not able to be with us. He had hoped to present the paper personally today, but has sent it in. It is along the lines of Prof. Baker's paper yesterday. The Secretary will read it for us.

BRICK PAVEMENTS, OR THE PERMANENT IMPROVEMENT OF CITY STREETS.

By W. E. Gunn, C. E., Covington, Ky.

Gentlemen of the Convention:

In the selection of material for the improvement of city streets no fixed rule can be laid down that one kind of material is the best that can be obtained, superior to all others. Such a statement would be mere prejudice. Many subjects bearing on the construction of each street must be considered. The size of the city, the present and probable future travel on the street, the grades that must be encountered, the class of property along the thoroughfare, the relative cost of different materials in that particular locality—each of these has its bearing.

In a fine residence district of a large city, where the matter of first cost, and cost of cleaning, would have little weight, compared to securing a noiseless street suitable for fast driving, creosoted wood block or asphalt might be well considered the best selection.

In a park, or for a lightly traveled suburban street, macadam or gravel could be regarded as equally suitable.

In like manner, a street in a manufacturing district, subject to severe travel, could be best taken care of with granite paving, while the ideal path for the sport of kings, is natural soil, as illustrated at Morris Park, Hawthorn, Saratoga or Latonia.

Each material has its advocates and its arguments, its real advantages and disadvantages—its own field of use.

In cities of medium size, brick streets, for economy and general utility, are better adapted than any other material. Such cities, say from 15,000 to 150,000 in population, as a rule, are not extremely wealthy and do not have the most severe travel to provide for. They must therefore select a material of sufficient strength and durability for the local needs, and take careful thought of the first cost of the material, as well as the cost of cleaning and repairing. The principal streets of such towns, if left in the macadam with which they have usually been first paved, become an expensive nuisance, intolerably dusty in the summer and unspeakably muddy in wet weather.

Street reconstruction becomes a necessity.

As to first cost brick paving may be estimated at $1.75 per square yard, including cost of concrete foundation. Asphalt will cost perhaps one-third more. After the period of guarantee has expired, the asphalt street will cost during the remainder of its life from five to ten times as much to repair as a brick street. Asphalt also costs fully three times as much to clean as brick.

On certain days in the year, when fine weather prevails, asphalt presents a delightful appearance, but if the weather is wet, it soon gets a slimy appearance, and in very dry, windy weather, a fine, disagreeable dust comes from the surface of the street that in the nature of things, must be unsanitary. It has the further disadvantage of being very slippery in freezing weather. It is not a superior street for hauling or for fast driving, though it equals brick in the latter respect. It has a tendency to roll and gather in lumps, leaving depressions in the surface. In very hot weather, it is soft enough to sink under heavily loaded wheels, producing the effect of hauling up a grade, even on a level street.

The local experience has been that the livery stable owners, teamsters, and all persons interested in constant use of the streets for hauling, prefer brick streets to asphalt.

A serious objection to the use of asphalt, is the fact that a city of medium size cannot afford the expense of maintaining its own plant for making repairs.

The existence of the asphalt trust and its manipulations of the supply of material, has in the past been detrimental to the use of asphalt. There always has been more competition for supplying brick than asphalt. Almost any city can find home labor sufficiently skilled for making all necessary repairs for a brick street, which is a desirable feature in the use of brick, and the fact that home labor can not repair asphalt is an objection to its use.

The material for brick paving can readily be examined and inspected to prevent the introduction of brick inferior to the requirements of the specifications and contract. The inspection of asphalt is much more difficult; it is the work of a specialist.

A further argument for the use of brick is its durability. The life of a brick street, before it needs repairing, is certainly of greater length than asphalt. As compared to asphalt, brick is therefore, in all ordinary cases, to be preferred.

Creosoted wood block paving promises a street superior to asphalt, but its cost, which is about two-thirds more than brick, prevents its use from becoming general at the present time.

In stating that brick is most suitable for medium sized cities, I do not mean that it should not be used in villages and large cities, but that its judicious use is proportionately greater in cities of medium size.

Assuming that brick has been adopted as the material to be used, let us examine what is at present good practice in laying brick pavements. At the present time, the brick generally used are 3 inches wide by 4 inches deep by 8 inches long. The foundation of the street is composed of about six inches of concrete. On this is placed a sand cushion of 1½ to 2 inches. The brick, after being laid in place, are rolled to a true surface, which produces a very much smoother and more perfectly formed street than was formerly secured by ramming. The street is then completed by filling the joints with a rich grout composed of equal parts of portland cement and fine sand. At intervals of about 25 feet, three or four joints are filled with tar to provide for expansion. It is possible that the joints could be more perfectly filled by brushing the mixture of fine sand and cement into the joints dry instead of in the form of grout. The use of cement instead of tar is a very material improvement. When the joints are thus filled, the paving acts as one piece. The street remains smoother and this decreases the noise, and is bound to add to the durability of the paving. A tar filler at certain times of the year becomes soft. Each brick can then go down separately. The paving becomes, to some degree, rough and therefore more liable to wear.

All tracks for street railway service should be laid with six inches of concrete under the ties. The use of grooved girder rails makes the least objectionable track for street purposes.

It is customary to limit the absorption of brick in specifications for street building to two per cent. This requires the use of a shale brick, and while the writer's experience favors this kind of material, the two per cent. limit is rather narrow. There is no connection between absorption and the ability of brick to stand an abrasion test unless the absorption is more than 2½ or 3 per cent.

The best wear of brick in the street, is not confined to brick that absorbs less than two per cent., though some of the best wearing brick are within the limit.

In order to secure the most satisfactory results in street building, it is very important to have all sewer, gas and water pipes laid before the street is built. It is almost impossible to repair the surface with its original perfection if cut open after completion. Medium sized contracts usually secure better competition and more advantageous prices than very large or very small contracts. All material and work should be guaranteed for sufficient length of time to demonstrate its good quality.

A most important feature of securing an attractive street is to build good and uniform sidewalks at the same time.

Streets carefully built and honestly inspected as outlined above, will give good results in use, and will add to the value of the adjoining property. Their cost is reasonable, and they will give satisfaction to the citizens. (Applause.)

Secretary Randall: This brings us to the last of the questions for general discussion. The first, No. 29, reads, "Is it Necessary for a Brickyard Superintendent to be a Practical Brickmaker?" One of our members, Mr. Alfred Yates, who rarely misses a convention, is unable to be with us this year, but he has written a little paper on this question, which I will read for him.

IS IT NECESSARY FOR A BRICKYARD SUPERINTENDENT TO BE A PRACTICAL BRICKMAKER?

Gentlemen of the Convention: Our worthy Secretary has allotted me the task of writing a paper on the following subject, "Is it necessary for a brick yard superintendent to be a practical brickmaker?"

I say most emphatically, yes. In the first place consider the large investment of capital required to build or operate a plant and the proper construction is one of the principal considerations in producing success or failure, and who can know how to build or operate a plant without practical experience? "The strongest part of a chain is its weakest link," and usually the practical man will develop so far and stop: either from lack of opportunity or choice. The office force becomes familiar with the outlines of the business and usually make their mark, with their superiors, by showing up the shortcomings of the practical man who always stands under the butt end of the log. They are quick with figures (which never lie) but frequently deceive and the practical man is placed in the crucible by these theoretic, inexperienced adventurers. It is very easy for these gentlemen to continually find fault, but it is another matter to find a remedy. Now I advise every practical man to study his business—it is thinking men who are successful. God gave us brains, but did not guarantee them so we must rely on our selves for improvement.

If the practical man would study the scientific end of the business, if he should attend Prof. Orton's or Prof. Binns's college for a year or more he would find it a very good investment, then take a course in a commercial school or study evenings by mail and thus develop gradually into the management of a business, what a difference we would experience; to find a practical man capable of converting the raw material into currency, being in full control of a business and while in charge of a business could direct the operators from start to finish: not asking his workmen what to do, but directing them in the proper manner, what he wants them to do. The patent sayings of burners and others would resolve themselves into strict application to duty and better results would be obtained.

The proper way to learn a business is to commence at the bottom and work up to the top, not commencing at the top and working downward to the bottom, by costly experiences.

I can recall a number of failures where inexperienced men were in control and in one particular where the parties had money galore, but the requisite knowledge of "Know how" was lacking, costing the concern upwards of a million dollars, for the reason they were in the habit of employing inexperienced superintendents.

It is impossible for a person to direct the course of management from a desk phone in the city when he does not understand the practical end of the business.

So many concerns are being ruined by interference from such men and the sooner the investors of capital in the clay business realize that they must interest experienced men the sooner some of these failures and sad experiences will cease. At present the trust theory seems to be a pet hobby, but I notice some of them are being broken by their own weight, and I think in the future, merit will be recognized and the schemers will meet a natural death. Every superintendent should be competent to work out his own formulas and burn his own goods and with a good business training these men would be what is so badly needed in the trade today. Let every shoemaker stick to his last, and let clay business be his occupation, should he choose this field of labor, and make no change, but continue to work out the difficult problems of his own profession until he crowns his efforts with success.

D. H. Applegate, Red Bank, N. J.: I only want to state the experience of a manufacturer of hollow brick very near my own plant. Mr. Moore, of Philadelphia, started a plant at Matawan, N. J., last year. They run with very indifferent success with two or three experienced superintendents. The results were so indifferent that Mr. Moore became very much dissatisfied, and he went to a friend in New York City and asked if he knew of any one who knew how to make a good hollow brick, and after thinking awhile, the friend said, "Moore, I know a young bricklayer who knows how to lay brick, take him down with you and see what he can do." Mr. Moore brought the young man to Matawan on the first of July, and told him to go on to the yard and do anything he saw fit, and the first day of August that young man, John Quinn, was made superintendent of the plant.

J. C. Boss, Elkhart, Ind.

They are now turning out 75,000 hollow block a day, and he has made a decided success of the plant. My conclusion is that it is simply a question of intelligence and brains.

Mr. Ittner: In answer to that question, I would say that I do not think it is necessary to be a brickmaker to be a superintendent of a brick plant, and I have had experience very much like the gentleman who has just spoken referred to, with reference to a man who had no knowledge of the brickmaking business. He is not a bricklayer, but a machinist. Of course, you have men in all the departments who are the heads of the different departments who understand their business, and you want a superintendent who has good command of men, a good judge of human nature, and if you get such a man as that it is not necessary for him to be a practical brickmaker to be a good superintendent of a brickyard. Some years ago we had a great deal of trouble with the foreman of our brickyard. We had men who claimed to understand their business, yet everything went wrong, and I finally got a machinist, a boilermaker from a machine shop, to come to our yard and he proved to be about as practical a brickyard superintendent as I ever had and he was not a practical brickmaker at all. Of course we had men at the head of the different departments, we had a head burner, etc., but the reason this machinist was a success, was because he was such an excellent man to command men and understand them. I was educated as an apprentice in both bricklaying and brickmaking, and carried on both lines of business for about twenty-five years. I have found men who have claimed to be experts at certain things, say, for instance, burning, that were no good at all. In my experience in the trade for forty-five years I suppose I have had as many as five or six scientific burners, men who would work around the kiln and not do anything but direct when the other men should fire up and the amount of coal to shovel and how, and how many shovelfulls and all that, and I have had most complete failures in that class of men than I have ever had with any class of employes. The best men I ever had were men who would just break into the business and work up into these lines. They do not understand anything about brickmaking, except what they were taught and they would make better successes than those who go around claiming to be scientific burners or scientific in any department of the business. Of course I do not wish to infer from this that all those who go around in that capacity, as especially qualified for certain things are failures, but in my experience I have found hardly an exception.

Questions for General Discussion.

Secretary Randall: The next question is No. 30, "How Can the Kansas Brickmakers Most Successfully Dispose of Lime Deposits on Top of Their Shale Banks." If Mr. Lundy is in the room I would like to have him discuss this question. You haye all heard that question, "What is the Matter with Kansas." If there is any man here from Kansas who can advise what to do, we will be glad to hear from him.

S. H. Alsip, Belleville, Ill.

Mr. Ittner: Does he say how much he has.

Mr. Randall: I think from three to six inches.

A. J. Wellington: I think the situation that confronts them is about the same as where there is about 8 to 10 inches of top soil. It should be washed off with hydraulic power.

President Purington: They must either remove it by hydraulic power or teams.

Secretary Randall: Question No. 31 reads, "Is it Practical to Slip Green Brick and Salt Glaze them for Light Colors?" Our scientists are minus this afternoon; ordinarily there are gentlemen present who could answer simple little questions like this.

Mr Crook: I think if the gentleman who asked that question would read Mr. Hardy's paper, he would get his answer.

Secretary Randall: The next question is one that is of interest to all of us, No. 32. "Would the Profit-Sharing System Applied to Brick Manufactories be Beneficial Otherwise." Is Mr. Busse here; we would like to hear from him.

B. H. Busse, Covington, Ky.: We adopted the profit-sharing system three years ago and we find that it works all right. In the length of time we have had no trouble from strikes and we have a better class of men to work for us. We can depend on them and that, too, right up to the end of the year, we set aside 25 per cent. of our profit and divide it among the men and they get this profit according to the ratio of the wages they earn. Last year they got about 8 per cent. of their wages. And as I have said we have no strikes.

President Purington: Are you unionized?

Mr. Busse: No, sir. I don't think this system would be possible with unions. We have in this town the Proctor & Gamble Soap Works, who use this same profit-sharing system and they have never been troubled with strikes or unions during the last ten or twelve years.

Mr. Alsip, Belleville, Ill.: I know a case that is different from the one this gentleman speaks of, where the profit-sharing system is employed. It is a gentleman from the town of Edwardsville, Ill. They have a large manufacturing company and they have started a little town not far from where Mr. Rogers has his business, and call the place Euclair, on the outskirts of Edwardsville, and this Mr. Edwards has been conducting his business on these lines for quite a number of years. I know he had a strike this spring in one of the departments of the works, where they get out the marble and they had an awful time and some of the men were very badly injured. The strike occurred over some nonunion men getting in to the works in some way, and they made certain demands on Mr. Nelson that he did not think just, and he resisted them and they struck, and he is now working that particular branch of his department as an open shop. But just how that works I do not know. It is my opinion that all other departments except that one are unionized and this particular department is all scab. The very worst sort of scabs. Now this is a case where the profit-sharing did not work. Now my idea would be that the other branches would strike against this department, unless it should be unionized, and I want to say to my young friend over there that he need not feel too secure. If he don't meet with strikes and unionism next year it will be because it is not ripe there—it is not indigenous to the soil. I want to impress upon his mind that the fact that he is operating on the basis of profit-sharing, is not of itself a guard against unionism and strikes.

Mr. Bruns, Brecon, Ohio: I have worked on what we call the profit-sharing system. I pay as good wages, if not a little better, than any man in my territory, and I do this; I hire good men, as good as I can get and to every man who stays with me during the season at the end of the season I give him as a premium 5 per cent. of the wages he has earned that year. I am not bothered near the end of the season with my men running away hunting another job. They have got to stay with me to the end in order to get the premium.

J. H. Chambers: There is a brickmaker in Philadelphia whom we know very well, who was so much impressed with the merits of what he called the premium plan, as we use it in our machinery making, that he has adapted it to his brickyard, and while he could not apply it as we do in our machine building, for the men doing their work properly, he does pay his men a premium on the number of days they make in a month. His trouble was, that his men would not work full time. He paid the regular rate of wages to those of his men who make the full number of days each month, he then gives them so much premium on the day's wages. At first they paid their premiums at the end of each thirty days, but found that some men would work thirty days consecutively and then lay off a day or two and spend the premium. As a result of this, last season they adopted the plan of paying the premiums at the end of each 100 days. They tell me that during last year they had no bother whatever with their men losing time, and that they have quite a number of men who did not lose a single day for the entire season. They have tried this for two years now, and have adopted the following plans as the most successful from their experience: The regular wages are paid each week, and in addition to this they pay as a premium, 10 cents a day for the first hundred days 20 cents a day for the second 100 days; 30 cents a day for the third 100 days during the season, paying these premiums at the end of each 100-day period. They say their foreman tells them that where a gang is interferred with by the absence of one or more men, that the men themselves in that gang exert some pressure on any individual number who may be inclined to lose time after pay day, and that this premium system gives the firm the advantage not only of regular ovens, but is also an incentive to the individual workman and also influences the more regular workman, as a whole, to keep in line the individuals who may be a little derelict and whose absence would interfere with the work of the gang. This firm is H. C. Carroll & Son.

Mr. Gregory: I was bothered for a long time to keep peace between the new men and the old men. Invariably the old men would say, you take on a new man and you pay him as much as you do us, and it isn't fair, so I conceived the idea of paying the old men a certain rate of wages, which is satisfactory to them. I made a statement to the men telling them that any of the new men who would come in and stay with us during the year, would have at the end of the season a compensation equal to that which was paid the old brickyard hands. We have done that for two years. Where we used to be troubled with men quitting their work at odd times, I now have steady men and they are all satisfied.

Mr. Ittner: I have been in the business forty-five years and this is a new idea to me, and the plan recommends itself to my judgment, and when I get home I'm going to call my boys together and talk it over, and more than likely when I come to the Convention next year, I will tell you that we have adopted that system of premiums for steady work. We have more trouble on our yard on that account than anything else, especially after pay day. It is just impossible for some men to work when they have a few dollars in their pockets. They are not easy until that money is gone. Then they come back two or three days after pay day and report, and as labor is scarce you cannot tell them to go about their business, for you are short of men, you've got to let them drop back in their old places. But with a premium method for steady time of 5 per cent. of their wages or any other per cent. of the wages we might agree upon, I think it will encourage the men to be steady. If we could do this it would be more in our favor than anything else which confronts us.

Secretary Randall: The last question on the programme is No. 33, "Can the Output of a Dry Pan be Increased by Grinding or Crushing the Tailings in a Separate Machine? If so, What Machine is Best Adapted for Such Purpose? Is the Scheme Economical and Practical for a Paving Brick Plant?"

Mr. Crook: I did not ask that question, but I would like to ask if anyone here has had any experience with the Williams Mill or a similar machine for handling the tailings from the dry pan. I have thought seriously of making some arrangements of this kind and I would like to hear from some one who has had experience.

Mr. Gregory: I should like to hear from Mr. Eisenhart.

Mr. Eisenhart: I had trouble about five years ago. I thought I was obliged to put in a machine to grind my tailings, and I arranged with Mr. Williams to give me a tailings grinder, and he placed the machine there for me to try with the understanding that if it was not satisfactory he would take the machine away. And it was not satisfactory. That might look to you rather discouraging of the Williams pulverizer, but the fact was the machine was entirely too small, and to show you that I have not condemned the Williams' machine, I have now a Williams pulverizer which I think is of sufficient capacity, at least it is guaranteed for that and a year from now I can give you the results. I am satisfied from what I have seen and heard of the Williams machine that it will do the business, the question is how expensive it is to keep the machine in running order.

Mr. Ittner: We are working one of these machines on our plant and it seems to me that if you had a machine of that kind of proper capacity you would not want any dry pan. How about that?

Mr. Eisenhart: It depends upon the hardness of your shale.

Mr. Ittner: You can throw a granite block or street paver in that machine and grind it to pieces, so there would certainly be no question about the shale. We have been working this machine in our yard for several years and we do not have any expense to speak of. Of course you have to have new hammers once in a while, but then you can set them out several times and lengthen them as much as an inch, or an inch and a half. At the very most I think we use two sets of hammers a year and they cost $50 or $60 a set. The machine we have grinds clay enough for common standard size brick, about 70,000 brick a day, and we can pulverize that much clay finer than we really care to have it. Of course when we got the first machine it ran with a speed of about 1,500 or 1,800 revolutions a minute, and that's pretty fast. I didn't like to be around it. I don't like to be around anything that goes that fast, and we found we had trouble with the boxes running dry and burning out. But we have an automatic feeder now and in the last year we have had no trouble. The machine is so constructed that any portion of it is adjustable. It is a very excellent machine. I can't tell anything about shale, but any machine that will grind up hard brick, flint and granite, it seems to me would work shale. There is some objection to the dust coming up, but we have a steam jacket around our machine now that prevents it from coming up from the dry clay. Mr. Williams is my fellow townsman, and I would not like to have any wrong impressions go out from here in regard to his machine. I do not think there is anything better with which to prepare clay. My son Warren, when we first got it, came to me and said, "Father, it makes the clay too fine," and we had to adjust the macnine differently. Some people might say you cannot get clay too fine, but the finer we get our clay the more spongy and flaky it is. Our molds are just so deep, and if we get the clay too fine, we cannot get enough clay in the molds to make good brick. You understand of course that we work the dry clay process and that it is quite dry clay, and when we work it and pulverize it, you can see the dust fly in all directions.

Wm. F. Scott, Keokuk, Iowa.

Mr. Copeland: Will it handle your clay direct from the bank?

Mr. Ittner: It would handle our clay direct from the bank, and Mr. Wiliams told me not long ago that he could handle almost any mud.

Mr. Copeland: I'm using a clay disintegrator and crusher and do not get my clay sufficiently fine, and if that machine will handle the clay direct from the bank, I may be persuaded to put one in.

Mr. Ed. B. Fish, Rochester, N. H.: I was not in the room when the very first of the questions No. 7 was taken up, the one relating to establishing standard tests for building brick. It is of vital importance to us fellows, who sell brick in Boston. In our part of the country our architects will not use a brick in a building unless it is as black as your hat, and if our hard brick happen to be a little light color, they will condemn them and Mr. Spiers, my partner, who looks after the sales is always in trouble.

The autocrat of the drawing table is too much for him and the last thing before starting for the Convention he told me that was the one question he was most interested in.

President Purington: The question was answered this morning by, I believe, Mr. Kimbell of Chicago, and he answered it effectively. He said it would be impossible to get up standard specifications for a building brick, owing to the different conditions and the different qualities of building brick throughout the country.

Mr. Fish: We must enter upon a campaign of education.

Mr. Bloomfield: Before we get off the questions for general discussion altogether, I would like to go back to the sand-lime brick questions and ask if they have ever tried the action of chemicals on these brick, and I would suggest that you be very careful in putting these brick into a building where you are going to handle chemicals.

Mr. Kutsche: I think some one made an investigation. In St. Louis, Mich., there is a chemical factory using sand-lime brick for some chemical purpose, I don't know what they are. Mr. Jackson, of the American Sand-Stone Brick Co. of Saginaw, sold the brick to these people and he has a testimonial to the effect that they have stood the test, but I do not believe they will stand sulphuric acid or hydrochloric acid, which I think is what the gentleman refers to.

The late J. C. ADAMS, Indianapolis.

President Purington: I will ask Mr. Fish of the Committee on Resolutions to read the report of the committee.

Mr. Fish: Mr. Shellenberger, the chairman of the committee, asked me to present these resolutions for him.

REPORT OF THE COMMITTEE ON RESOLUTIONS.

Gentlemen of the Convention:

Your Committee on Resolutions submit the following report:

The Eighteenth Annual Convention of the N. B. M. Association is about to pass into history, and may certainly be safely called one of the very best meetings ever held by the Association. The central location is probably responsible for the very large attendance which, according to the register, is over one hundred in excess of the number shown by the register at Boston, last year.

The regular programme has been if possible, more interesting and instructing than usual. Too much cannot be said about the papers and talks given by the professors from our schools of technical training, which have been presented to this Convention, and it is hoped that this feature in the programme may not only be enlarged, but that these excellent men may be given every possible encouragement in the great work which they are doing.

The unanimous thanks of the members are due, and they are hereby tendered to the Brickmakers of Cincinnati and vicinity, and the members of the Entertainment Committee who have done so much and with such marked success for the pleasant and successful entertainment of the Association.

To the ladies of Cincinnati who have so kindly given their time in the generous entertainment of the lady visitors of our Association, we tender our most sincere and hearty thanks.

Resolved, That the N. B. M. A. appoint a committee of one person, preferably the Secretary of the Association, for the purpose of requesting the express companies to reduce the express charges now made upon brick, sand, clay or other materials entering into the construction of brick, to such a charge as is reasonable in comparison with charges made for other commodities of a higher grade and value.

Since our last meeting the Great Reaper of all our final harvests has passed through the field and the following named members have been called to their last home: L. J. Howard of St. Louis, C. A. Schultz of Rondout, N. Y., J. C. Adams of Indianapolis, J. A. Francis of Shamokin, Pa., G. T. Howe of Leeds Junction, Me., Henry Maurer of Brooklyn, N. Y., L. D. Haggerty of Detroit, Mich. To the families of each of these deceased members are tendered the condolences of this Association.

Since our honored Ex-President, J. C. Adams, was an unusually active member of the Association, and had once occupied the executive chair, it is deemed advisable by your committee that a special resolution be offered and the same is herewith made a part of this report. The following resolution is recommended by the committee for adoption by the Association:

IN MEMORIAM—J. C. ADAMS.

Jesse Adams is dead. Only a few days ago, in the midst of an active and useful life, rich in the qualities of mind and heart which make youth lovable and age admirable, he has obeyed the call of the Grim Reaper.

To those who knew him only in business, his death will call forth sincere regrets, for he had that frank manliness in all his dealings which coerces friendship with all among whom he lived and moved.

To those who knew him in the affairs of state, his death will call forth a deeper concern. He was prominent in public duties, tactful, considerate, slow to take offense, but firm in his stand for public order and public honor. As speaker of the House of Representatives of Indiana, he won a permanent place in the annals of that State. He was one of the kind of men whom we cannot afford to lose.

But to the members of this Association, this announcement strikes with the force of a personal loss, for to us he was a brother rather than a friend. His warm heart was big enough to enfold in its affections this whole Association, and his mind constantly reverted to us in the days of his last illness. To get well in time for Convention, was the thought which dominated him to the end.

Comrades! he is gone. Never again shall we feel his firm, hearty hand clasp, nor hear his big resonant voice sound its note of welcome, nor catch the contagion of his genial mirth, nor yield to the spell of his eloquent sentences, on the floor of our meetings, nor bend to the wisdom of his leadership in the affairs of our management. He is gone, but he leaves behind him a void in our hearts and minds, which time will never fully fill.

To his heartbroken widow we tender our sincere sympathy in this, her hour of trouble. May she find help to bear her loss, from the memory of his generous, useful and honorable life.

GEO. H. SHELLENBERGER, St. Paul, Minn.
EDW. B. FISH, Rochester, N. H.
ALBERT KLEIN, Baltimore, Md.
A. SMITH, Portland, Ore.
LEMON PARKER, St. Louis, Mo.
WM. SUTTON, Table Rock, Neb.
T. L. HERBERT, Nashville, Tenn.

Mr. Fish: I now move, Mr. President, that the resolutions be adopted and placed on file.

Mr. W. P. Blair: I would like to amend that motion by moving that the memorial resolution relative to Mr. Adams be acted upon separately and that we adopt this by a rising vote, out of respect to the deceased, for we all knew him and loved his as a brother.

Mr. J. M. Blair: I would like to make another amendment and that is that a copy of these resolutions in regard to Jesse Adams be engrossed and sent to the wife and family.

Mr. W. P. Blair: I accept the amendment.

Mr. Fish: I accept both the amendments.

The motion was seconded by several and adopted by a rising vote. The Convention then adopted the report of Resolution Committee as a whole.

Secretary Randall: There is another matter which I have overlooked. I have letters of invitation from a number of places for the holding of our next Convention including Chattanooga, Tenn., and Detroit, Mich., and I believe there are others who wish to join this list.

CHATTANOOGA WANTS THE NEXT CONVENTION.

Mr. T. A. Randall, Secretary National Brick Manufacturers' Association, Indianapolis, Ind.:

Dear Sir—The city of Chattanooga, through its Chamber of Commerce, hereby extends to the National Brick Manufacturers' Association its heartiest and most cordial invitation to hold its next session in Chattanooga.

Chattanooga is a city of over 50,000 inhabitants, and is a railroad center of the South, having eleven lines of railroad entering here, thus making it easy of access to any and all parts of the country. The hotel facilities are perfectly adequate to entertain any number of delegates and their friends, and in addition to that, there are numerous restaurants and rooming houses.

The city of Chattanooga stands inseparably linked with the names of some of the greatest battles of modern history and the greatest military leaders of our time. Proof of this is shown by the fact that the United States Government has spent millions of dollars and will in the near future, spend as much more in the beautifying and enlargement of the National Military Park, Missionary Ridge, and the National Cemetery where sleeps a vast army of the nation's heroes.

All States who had troops in the battles of Chattanooga, Chicamauga, Orchard Knob, Missionary Ridge, Lookout Mountain, and the other battles that were fought in and around Chattanooga, have erected magnificent monuments to their heroes, and these battlefields are covered with them.

Monuments, historical tablets, and mounted cannons mark the lines of these battles, and the lines of works of both sides have been restored. Two lines of electric railway can carry our visitors to any one of the places of historic interest.

We have an auditorium that will comfortably seat 5,000. Lookout Inn, on the summit of Lookout mountain, 1600 feet above the city, has a spacious hall that will accommodate 500, and has ample accommodations for as many visitors for any length of time.

The climate of Chattanooga is ideal at this time of year with its clear, bright days and delightful nights and is a revelation to all our visitors.

We not only offer you all the facilities of the best convention city of the Central South, but the warm, earnest welcome of a people whose hospitality is well known.

Trusting to have the pleasure of receiving you as our guests in 1905, we are,

Yours respectfully,
C. W. HOLBROOK, *Secretary.*

Chattanooga, Tenn., Dec. 29, 1903.

AN INVITATION FROM DETROIT.

Mr. T. A. Randall, Secretary National Brick Manufacturers' Association, Indianapolis, Ind.:

Dear Sir—If the place of meeting for your next annual convention has not yet been decided upon, we should like very much to have the advantages of Detroit considered, and, if practicable, to have your meeting here. Detroit is chosen for a greater number of annual conventions than any other American city, because of its centrality, accessibility and attractiveness. The facilities of the city are exceptional for contributing to the comfort and enjoyment of large gatherings. We should be pleased to hear from you, and to furnish you with any information in this connection that you may desire. If you will kindly give us the names of a few of your representative members in Detroit, this favor would be much appreciated.

Respectfully yours,
WM. C. RADCLIFFE,
Secretary Convention Bureau.

Detroit Mich, January 4, 1904

Birmingham, Alabama, Makes a Strong Bid.

Mr. Copeland: While we have a somewhat larger representation here at this meeting from the South than we have had sometimes when it has been farther north, I think we are not sufficiently represented yet. I think those who are here from the South have been greatly benefited by attending this Convention, but there are a good many, good, clever, whole souled, big hearted brickmakers in the South who know nothing of the good to be obtained from these meetings, and if we can get you people to come down South and hold a convention in Birmingham, where I have resided for 22 years and have learned to think is the best town in the South, that you can do more good than you can in any other locality. During the last year Secretary Randall was in our city and he looked over our plants, met our young, enthusiastic, enterprising mayor, who at that time extended an invitation to the National Brick Manufacturers to hold their next convention in Birmingham. I called him up just before leaving for the train and he told me to extend to this meeting a hearty invitation to come south to Birmingham. The brickmakers in our section have sometimes evidenced a good deal of enthusiasm in regard to coming to the convention up to the time of packing their grips, and then they back out. There are several of us here today from the South and we have all benefited by our experiences here and hope we will be in a position to lay this matter before your Executive Committee in a manner that will induce them to come to Birmingham and we will extend to you a hearty Southern welcome. (Applause.)

President Purington: On behalf of the Association I wish to thank Mr. Copeland for his kindly invitation. It is not necessary for him to tell us of the hospitality of the South. We have many of us been south and sampled it. The matter will be considered by the Executive Committee in due time. I hope that before we meet again our membership will have increased even more than it has in the past year.

Secretary Randall: The membership roster shows an increase over any previous year and we have the largest attendance at this Convention that we have ever had.

T. C. LUNDY, Knoxville, Tenn.

Mr. Eudaly: May I say a word? I have been in the halls and lobbies hereabouts during the Convention trying to entertain the visiting members as best I could and have not taken part in the discussions, as much as I should have liked to have done so, but I will make it up next time. I want to say this, it has occurred to Brother Blair and myself of the local committee, that after all, while Cincinnati is not thought by some to be the greatest place in the world, still we have discovered that you can hardly go anywhere in the United States without going through Cincinnati. You can't go north to Chicago without going through Cincinnati, and if you go west you are obliged to go through Cincinnati, and when you are going east you must go through Cincinnati, so that when you go to the next Convention and stop off in Cincinnati, we want you to call and we will give you a good welcome and take care of you during the night, or as long as you stay, and if necessary provide you with scrip for your journey. We feel greatly repaid for your coming this year, and now as you can't go anywhere without going through Cincinnati, let us know the time of your train and we will be here as of old and will do the best we can to make you welcome. Mr. Blair is mad because I am talking too much and Brother Bruns over there is tickled to death over the prospects of having you stop here on your way to the next convention, but seriously we have been glad to have you here with us.

J. M. Blair: I know that Mr. Eudaly does like to talk. I want to say that the Cincinnati contingent has been enough in evidence without wanting to put in any more time talking. We have endeavored from the beginning until the finish to entertain you and while in a modest way we have done what we could to make your stay pleasant, we cannot regulate the weather, I am sorry to say, but we have done everything we could to have it pleasant for you and if we have failed of course we can't help it. I have heard from all sides that the brethren seemed well pleased, and if that is the case we feel fully compensated for our labors and Mr. Eudaly says for you to stop here on your way to the next convention and we will all be glad to shake you by the hand. We, the Cincinnati brethren, have been so much impressed with this Convention that I think you will have every member with you from Cincinnati at your next convention.

President Purington: The kindly sentiments expressed by the Cincinnati brethren are appreciated fully. I am sure I voice the sentiment of every delegate to this our Eighteenth Annual Convention, when I say that we have enjoyed our stay here immensely, every hour of it. This has been one of the most successful Conventions we have ever held, and the thanks of the visitors are due to the local people who have been so generous and hospitable. Our stay here has been made very pleasant and I am sure there is not one among us all who will not take home with him many pleasant memories. Now that we have reached the closing moments of this the final session for the year, I wish to thank you most sincerely for the distinguished consideration shown me as your presiding officer, and I assure you that I will do my best to strengthen and extend the influence of our Association during my term of office. Again thanking you, gentlemen, I await a motion for final adjournment.

Secretary Randall: There appears to be a reluctance to say the final word, which considering that we have been hard at work for three days, is rather remarkable. May we not properly close with the words of the Chicago Messiah, "Peace be with you."

Adjourned sine die.

THE ANNUAL BANQUET.

A Splendid Entertainment—Excellent Music—Fine Speeches and Incomparable Good-Fellowship.

A HOOSIER POET'S LAMENT.

Dear Brothers, I regret I am unable
To be with you about that banquet table;
But in my stead I send you kindly greeting,
And warn you against the crime of *over eating*.
And when the tempting dishes are supplied,
And nothing that's delicious been denied;
Remember when temptation's up to you,
How Sloveny Peters, *Jacob, burst in two!*
When rival wits are drawing from their fund,
And every stomach present is rotund;
When you tell those ancient stories try to word them,
So the rest may really think they never heard them.
Should any wretch a doubtful story shed,
First call him *down* then send him *up*—to bed.
Oh, could I share the fun, you will express,
When that wine begins to *fiz* and *effervesce*,
When you return to wife and baby cute,
Don't let your looks, I pray, suggest a *toot*.
—M. C. Meigs.

THE SOCIAL EVENT of the eighteenth annual N. B. M. A. Convention was the associational dinner or banquet and it proved the most delightful occasion imaginable. The spacious dining room at the Grand Hotel was literally full to overflowing. Three hundred plates were laid and the overflow was accommodated in the adjoining "ordinary," itself a good sized dining room. The presence of the ladies gave color to the picture—a living picture which those who participated will ever remember with a sense of delight. The dining room doors swung inward at eight o'clock, and after an hour devoted to the substantials prepared for the occasion, which were ample, as may be seen by the following menu, and well served, the interesting ceremony of the evening was begun by a rousing song, excellently rendered by a quartette of professional singers, during which those who had tarried in the adjoining room found seats in the main dining hall, and gave their attention to Toastmaster Eudaly, and the honored guests who responded to the various toasts assigned them.

MENU.

Blue Points.
Salted Nuts. Olives.
Consomme, in Cups.
Boiled Red Snapper Potatoes, Naturale.
Chicken Croquette, Green Peas. Larded Tenderloin, Mushrooms.
Mashed Potatoes.
Head Lettuce, French Dressing.
Ice Cream. Cake. Coffee.
Apollinaris Cigars

Toastmaster Eudaly: Ladies and Gentlemen, guests, fellow brickmakers and brickmakeresses.—I am very glad indeed that we are all here. I am informed by our Secretary that the word "Introductory," as found on the programme, does not mean a speech, in other words your toastmaster is a sort of a starter and not expected to say very much. I cannot help, however, calling your attention to this list of toasts. For some time past at our annual meetings some little criticisms have been passed because of our going off into frivolities and not having much weight in what was said at our banquet table. A clamor has gone up for something more serious, something touching upon the vital issues before the American people, something that we could meditate about and feel that we had accomplished something in the way of reason at least, and so our Secretary has taken the criticism seriously and consequently he has offered to us this evening such themes as "The Open Door." Much has been said of late in Congress and through our political press of the "Open Door" question. Then there is the "World Power." In these signs of the times of war we hear a great deal about the "world powers." Then there is "Our Competitors." Oh, how jealous we are of our competitors across the waters, and much has been said on this subject. We heard so much about "Fragments," you know, after the late unpleasantness with these islands just below us. Then "The Other Fellow" comes in for his share. Our Secretary was very wise and he tried to comply with your request, and now you are to understand that we are to discuss very weighty questions and the ladies will be allowed to take part in the discussions, and it is hoped we will hear from all. We want to settle some of these questions once for all. We notice the printer was not very original in his arrangement. We have taken the liberty of advising with every one who wanted to give advice and have changed the programme somewhat and with your permission we will first hear of the "World Power" from my fellow townsman, the Hon. Wm. B. Melish. In Cincinnati and in Ohio and all the adjoining States, so far as I know, it is not necessary to explain who the Hon. Wm. B. Melish is, every one knows him, and he is here and so without further ado I take pleasure in introducing the Hon. Wm. B. Melish. (Applause.)

THE WORLD POWER.

Mr. Toastmaster, Ladies and Gentlemen:

Some days ago I was notified that I had been honored by the National Brick Manufacturers' Association by being placed upon the list of speakers for this evening's program. I was told by the genial Secretary that I was to tell you about "The World Power." I presumed, of course, that the usual laudation was expected of these big United States of ours; our new possessions, our big navy, standing army, "chip on our shoulder," "can lick the whole earth," in short, what a "World Power" we are. Just after I had read a whole lot in the "Encyclopedia Americana," and was almost bursting with information about "World Powers," I ran across Secretary Randall and told him what a magnificent spread-eagle effort I was concocting, and he said, "My dear man, how stupid you are, why your real topic is 'The Ladies,' they are the *real 'World Power.'* See!" And I saw. I was as far away from my subject as the preacher who approached a street gamin of about ten years of age, who was puffing a cigarette with great pleasure, and emitting a great volume of smoke, and said to him, "My son, can you tell me where the Second Presbyterian Church is located?" "Sure Mike," said the boy, "go down two blocks 'till you see de big steeple." "Thank you, my son," said the preacher. "Oh, by the way, my boy, don't you know that smoking those vile cigarettes is likely to kill you, and if you were to die with this bad habit, you cannot enter the kingdom of heaven." "Oh, rats," said the kid, "what do you know about heaven? Why, you didn't even know where the Second Presbyterian Church was." (Laughter.)

So you see I can hardly be expected to talk about the ladies as "The World Power," when I never knew they were "it," hence I approach the subject, and the ladies, with all the awe that a man who has been married thirty years is capable of. I remember it was Longfellow who sang:

"As unto the bow the cord is,
So unto the man is woman:
Though she bends him, she obeys him,
Though she draws him, yet she follows;
Useless each without the other."

According to this these charming women who so beautifully grace this feast are the cords, and you brickmakers are the bows, which perhaps accounts for some of you being so high strung. It also explains the pull these cords have upon you, but beware, ye feminine cords, the bow breaks when the pull is too strong. Remember, "Though she bends him, she *obeys* him," therefore, after this banquet, obey "hubby" and "Papa" by going at once to your rooms, because he has to stay in the hotel lobby and talk about the best way to molsten clay, and a few other trade secrets for about half an hour. (Laughter.)

"Though she draws him, yet she follows,
Useless each without the other."

Longfellow evidently penned those lines after seeing a devoted wife take her husband on a shopping expedition, she to do the buying and he the paying. But struggle as we may, we cannot do without these dear women, and we are indeed useless without them. It has been so since the world began, and it will doubtless be so until its end. After the Creator had made all the *useful* things, such as the earth, sun, moon, stars and MAN, He turned his thoughts to the ornamental and thought there ought to be something done to keep all the useful things stirred up, and moving, so He made woman, the serpent, an apple tree and a few animals; and the procession has kept up for many centuries, with poor man in the lead, on the jump continually, pursued by "The World Power," represented by the balance of creation.

I have always believed that Garden of Eden story about "The first lady in the land" and that missing rib. All of you young men can easily realize it, because when you approach a pretty girl on matrimonial thoughts intent, you will have a peculiar sensation between the ribs, a sort of an aching void next to the heart, which nothing but the dear girl can completely fill. All of you old married men can swear to it, because when you come home late, and "She," the "rib-roast" addresses you, do you not feel a goneness, and a heart sinking which words cannot express, and which your tongue had better not try to do. The very name of this new "World Power" is suggestive. Well has the poet said:

"When Eve brought woe to all mankind,
Old Adam called her woe-man,
But when she woo'd with love so kind
He then pronounced her wooman.
But now with folly and with pride
Their husband's pockets trimming,
The ladies are so full of whims
That people call them w(h)imen."

Ladies, if we make fun of you publicly it is because we do not dare to do so privately. You are indeed the present all-powerful "World Power," and we small mortals, called men, are only mere microbes, who can only stand and look on admiringly as "the World Power, she do move," as Bro. Jasper preached about the sun.

Sheridan said, beautifully, "Women govern us, let us render them perfect. The more they are enlightened, so much the more shall we be. On the cultivation of the mind of women depends the wisdom of men. It is by woman that nature writes upon the hearts of men."

Col. Wm. B. Melish, Cincinnati, Ohio.

Do not imagine for a moment that we do not appreciate you. What more precious offering can be laid upon the altar of a man's heart than the first love of a pure, earnest and affectionate girl—with an undivided interest in fourteen three-story houses and a lot of bank stock and government bonds. (Laughter.)

Now that the brickmakers have pronounced the ladies to be "The World Power," and therefore to be respected and feared by all men, we must pause and consider what a variety of these dear women are now assembled—I was about to say embraced—in these United States. There are several new women. First, our Alaskan sisters, wrapped in furs and redolent with the odor of a newly snuffed tallow candle; then the dusky beauties of the Hawaiian Islands, who swim out to meet the mail steamers clad only in a string of pearls and a smile of innocence. Then there are the belles of the interior tribes of the Philippines, whose full dress for opera wear is said to be their complexion, and some so darkly clothed that they seem to be in perpetual mourning. All these make up the new "World Powers" and are quite overpowering to a modest man like the speaker. If all these newly acquired possessions are to be duly acknowledged and taken care of, we men must look up our rights and stand up for them. Hitherto we married men have blindly followed and meekly and obediently looked up to you women; but the worm will turn. Only last week a Chicago judge refused a divorce to a poor man who had been thrashed by his wife, and the judge said, "I have no patience with the man who lets his wife thrash him." It is the duty of the husband to make the wife obey. He should exercise a corrective sternness where necessary, and show that he is master of the house. It is not necessary to beat her to accomplish this. Take hold of her sharply, make plain the fact that she is exceeding her wifely obligations, and impress upon her that the man is the ruler of the home to an extent that precludes any right of violence from her. Men permit their wives to overrule and dictate to them and then come begging the courts to grant release from irksome bonds."

What an appalling spectacle in this liberty-loving land of ours to see a judge refuse to protect a poor man against the inhumanity of his wife. Oh for a return to the days of protection, when an act of parliament was passed, in 1670, "To protect men against artificial aids to beauty and women's wiles." It read, "That all women, of whatever age, rank, profession or degree, whether maids or widows, that shall, from and after the passing of this act, *impose upon or betray into matrimony* any of His Majesty's male subjects, by scents, paints, cosmetics, washes, artificial teeth, false hair, Spanish wool, iron stays, hoops, high heeled shoes or bolstered hips, shall incur the penalty of the laws now in force against witchcraft, sorcery and such like misdemeanors, and that the marriage, upon conviction shall stand null and void." That's the kind of law these bachelor brickmakers are entitled to, ought to have, but alas! will not get, especially in this sad leap-year season.

I admit that poets, and novelists, and other weak minded people take quite a different view of the modern "World Powers," the ladies, but that must be because they are afraid to tell the truth. After-dinner speakers responding to the toast of "The Ladies," usually fall into the wicked pernicious habit of praising the dear girls until they are too vain to recognize their own faults, and almost too self-complacent to live with. Truth is mighty and must prevail, and we would not have the charming, bright eyed inspiring ladies present spoiled for all the world. May I venture upon a little timely advice. To you young maidens I want to say that it is a solemn thing to get married, but it is a great deal *solemner* to be single. Be not deceived by appearances. Many matters in courtship are not what they seem. Love is like a river; if the current be obstructed, it will seek some other channel. It is not unfrequently the case that the kisses and attentions bestowed on your little sister of six years are really intended for her sister of eighteen. Let this comfort you. Young ladies, never be afraid to tell the truth. When your pastor asks you in Sunday School "What is your consolation in life and death," do not blush or hesitate. Speak right up, tell the young man's name, or at least where he lives. Be not weary of well doing. I remember a dear ingenuous girl who sat out in the evening hour with her best young man and agreed to give him a kiss every time they saw a shooting star. The shooting stars were few and far between, but that dear, artless but energetic girl switched in and counted nineteen lightning bugs as shooting stars, and had started in upon the swinging of a lantern in the hands of a railroad brakeman before the poor young man found her out. (Laughter.)

J. B. Kendall, Washington, D. C.

To you older ladies who have the rare felicity of being our wives, and thus enjoying our companionship, a few words may not be ill-timed. Remember the Bible tells of a woman possessed of seven devils, but no record is made of any man having that many cast out of him. I know what you want to say. That, "the devils must have been husbands," and that with we men the devils *never were cast out,* but are still there; but this is no time for any back talk. Remember what a spirit of forbearance we men always show towards your little shortcomings. I remember one generous husband, who sadly said to me, "If my wife choses to throw things at me or throws me out of the house, very well. If she is that sort of a woman, very well. I am sorry for her but I can't help it. How can I communicate to her nature those little subtle refinements and delicate graces that are alone the prerogative of finer spirits."

Dear "World Powers," it is in the charmed family circle that we forget everything but your sweet domestic virtues. As sweethearts you are charming, but as wives and mothers you are divine. The woman who has never loved, hugged, kissed, played with, listened to, told stories to, or thoroughly spanked a child of her own, has missed the cardinal joys of life. The man who has not had the love, inspiration, companionship and devotion of a good woman is a lost mortal. He has missed his Paradise in this world, and he will probably be unhappy in the next one, for he will be like the man to whom the keeper of the Gates of Heaven said, "Ah, you are from Boston, well you may come in, but you won't like it." (Laughter.)

If we have seemed somewhat mixed in our compliments to you this evening, regard us with that same spirit of wonderment, and at the same time satisfaction, which animated a little friend of mine, who said, "Papa, where were you born?" "In Philadelphia, my dear." "And where was Mamma born?" "In San Francisco, dear." "And where was I born?" "Here in Cincinnati, my love." "Well," said the little girl, "isn't it funny how we three people got together."

Finally, ladies, we have got together on one point at least. You are hereby constituted and proclaimed to be the power that moves the world. Sisters, we lay our best efforts at your feet. Make a brick pavement of us if you will, and step on us all you please. All we can ask of kind Providence is that we each be permitted to have by our own fireside

> "A perfect woman nobly planned,
> To warn, to comfort, and command,
> And yet a spirit still and bright
> With something of an angel light."

(Laughter and prolonged applause.)

Toastmaster Eudaly: Ladies and Gentlemen,—I believe we are prepared to continue our serious consideration of some of these questions and with your permission I will change the order still further and we will listen a little while to "The Other Fellow." I have the very great pleasure of introducing the Hon. W. H. Hunt, Cleveland.

Mr. Hunt: When the Secretary suggested to me that I have some part in the programme, it was first indicated as his pleasure that I should have something humorous, but later on he gave me the toast, "The Other Fellow." In my consideration of this subject I am reminded somewhat of a fellow brickmaker, whom we all know, who was in the habit of returning home late occasionally, somewhat under the influence of liquor. His wife on one occasion undertook to upbraid him for his conduct and she said, "When you see you are getting drunk, why don't you take sarsaparilla." And he said, "Why my dear,, when I am drunk I can't say sarsaparilla." (Laughter.)

THE LABOR PROBLEM, THE MAIN INDUSTRIAL ISSUE.

By Wm. H. Hunt, Cleveland.

Mr. Toastmaster, Ladies and Gentlemen:

Friction caused by human contention has ever been and must always be an infinite force in the world's progress and development. The earliest pages of our national history reveal a people divided upon the great questions affecting public welfare.

"Competition the life of trade," is a familiar maxim. As an equally important truth it may be said that political contention is the life of the nation. In the religious world denominational strife has in no wise hindered the spread of Christianity.

Since the days of Washington and the revolution, the brightest minds and deepest thinkers have been found upon both sides of all great national questions. Once in the history of our country has civil war been waged, that the contention of the superior force might establish the right.

There would seem to be something perverse in human nature when an enlightened people separate into two great divisions, holding diametrically opposite convictions upon a question of right and wrong, each contending with equal confidence the right of its position and the wrong of its opponents.

In our republican form of government the two great dominating powers furnish that restraining influence which prevents despotism.

Our prosperity as a nation has been neither hindered nor obstructed, but rather aided by these two opposing powers. Our country and the flag move majestically forward, with main issues in our national life constantly in dispute.

In politics, in religion and in trade, human contention has but stimulated the development of these three main elements of our national being. As a result of our phenomenal industrial development, however, new problems of momentous gravity have arisen, in the solution of which all party lines must be obliterated and a united and patriotic people must protect our institutions from the dangers which threaten.

Out of the gloom of the panic of 1893 there emerged a new principle of finance, heralded as a remedy for the industrial ills that brought about that long period of business depression. Destructive competition it was claimed, had created such conditions as made necessary the combination of competing enterprises.

The economic theory advanced in support of this new factor in trade, was that by creating a practical monopoly and centralizing executive management, greater stability could be maintained, and such economies effected both in production and distribution that without enhancing the market price of the commodity, would insure a fair return on the capital invested.

However, unbridled power centralized in great trusts and combinations of capital, in large measure subordinating legitimate business to the speculative mania, and disregarding natural laws, has driven so hard the machinery of trade that the main parts call for readjustment.

Actuated by similar motives and inspired largely by the aggressive methods of organized capital, labor has been infused with the spirit of the times and has intrenched itself in formidable union, making such demands as can no longer be sustained.

Capital and labor must share, therefore, the responsibility for the present reaction from the flood tide of business prosperity, and they are equally interested in such corrective measures as are necessary to sustain public confidence and insure greater stability and harmony in trade relations.

Human nature is much the same, whether the man be master or workman, and when men are associated together in a corporation or a union, there is but greater power given the same instincts. The employer and the wage earner alike have striven to profit in the utmost measure during the recent years of our industrial prosperity.

Sharp practice and studied treachery of many so-called captains of industry; men occupying high places in public confidence using their positions of trust for personal gain; the tyranny and utter selfishness of the labor agitator, against these evils public conscience protests.

The paramount question therefore is, in what manner can public confidence be sustained and prosperity continued?

Eliminate the unscrupulous leader; he whose creed is selfishness and self-aggrandizement; whom to follow is at fatal cost. We have a common enemy which must be met with a solid front until this menace shall have been exterminated.

So confident have been the American people in the stability and permanence of our prosperity that during these years of strenuous commercial activity no heed has been taken of the infectious germ that has been gradually destroying the very foundation of our industrial success—public confidence.

Practically no restraint has been exercised or remedy suggested, until the evil wrought has resulted in general alarm and this present temporary period of business cessation.

Let us apply the remedy. Change the personnel of the executive staff, where necessary. Choose an honest leader. Whether a corporation or a union of wage-earners, choose men who have a just regard for the rights of the public and will not defy the law or assail the rights of citizenship, but who will apply business statesmanship, justice and common honesty to the practical solution of our trade and labor problems.

The governing principle should be recognition of the rights of all the people. Whether employer or employe, representatives of each should stand firmly for these principles, and insist upon their observance.

The manufacturer and dealer seem to have found a common ground upon which they can meet in the exchange of business, and maintain peace and harmony in their trade relations. The manufacturer or the dealer may sell to whomsoever he may see fit, and he may buy from whomsoever he may see fit, unless the material he must buy is controlled by a monopoly, in which event as a matter of business necessity of facility, he sets aside any scruples he may have with regard to trade monopoly or the trust.

It is the aim of the manufacturer or the dealer to obtain, when selling his product, the highest market price; when purchasing material, to buy as low as possible. If there exists a practical monopoly in a given material, and the scale or price is fixed, the purchaser accepts the inevitable, and pays the price demanded. He does not attempt to "smash" the combination because the combination has been effected, destructive competition had perhaps so demoralized the industry as to make consolidation of individual plants a necessity, that a "living profit" might be insured upon the capital invested. If he can buy equally satisfactory materials and be assured equally satisfactory service from an independent plant, for less money, he will surely do so. He feels no concern as to the methods employed by the trust to bring this belligerent plant into the fold or perhaps to drive it out of business altogether.

It is a fact that can be abundantly proven that many times the methods of the trusts, the organized employer, are equally as pernicious as those tactics adopted by the unions toward non-union men, and with like motive, the creation if possible of a practical monopoly. Is it not likely that organized labor may have learned some of its practices from the organized employer? If it is right, or if economic conditions justify the employer in his endeavor to create a practical monopoly in his business, must not the same right be conceded, and do not the same laws justify the wage earner in his endeavor to accomplish the same object?

In the building trades the labor problem is most severe. In so far as the building contractor is concerned, his interest would seem to be greatest in having such conditions obtain as give the greatest and most permanent stability to market conditions, and harmony and peace in his trade relations. The position occupied by the building contractor is a hard one. His business cannot be consolidated, either locally or upon a larger scale. It is not possible to centralize the executive direction of his affairs as has been so largely done in other branches of trade. His purchases of material are made to the best advantage possible; sometimes he is obliged to deal with the trust. He feels the same right to purchase his labor to the best advantage possible, and again sometimes must deal with the trust.

No stability or permanency obtains because the trust managers are ever watchful of an opportunity to advance prices. The law of supply and demand is the unfailing governor that must always create more or less fluctuation in market values.

Digressing for a moment, and touching upon the question of organization among the builders, there must ever be competition in the building trades. The varying individual talent, the individual capacity cannot be combined upon any commercial basis of equality.

Eben Rogers, Alton, Ill.

During all this period of the merger and the combination, the builder has stood alone, practising his trade in his own peculiar way, and fighting his battles as his individual judgment has directed. Trade associations have been but partially effective in accomplishing the desired end, and no association representing a single branch is strong enough to sustain the fundamental principles vital to the industry as a whole.

The builders' exchange idea affords primarily a business convenience, a social and sometimes a legislative body. The aggressiveness of organized labor, the frequency of unreasonable, unlawful and uneconomic demands, the pernicious practices of many of the unions, due in large measure to the so-called "walking delegate" or business agent, the enforcement of the sympathetic strike, the boycott and other evils, have made necessary compact and effective organizations of building trades employers that their own interests may be properly protected.

The Building Trades Employers' movement supporting certain fundamental principles which are but the rights guaranteed every American citizen under the constitution of the United States, is moving forward with a mighty impetus.

A grave danger lurks, however, in the haste with which some of these movements are thrown together, and the conflict of opinion as to the wisest and best plan of procedure. Conditions have been more favorable in some cities, for unionizing the various crafts, thus obliging the contractors to adopt generally, the policy of trade agreements, which establishes practically the policy of the closed shop. Greater resistance to the demands of union labor in other cities, has made possible a continuance in part of the policy of the open shop.

It is not my purpose to discuss the merits or demerits of either policy, but I confidentally express my belief that the trade agreement, defining, as it does, for a period of time, the wage scale and hours and conditions of labor, is the one instrument that has prevented the building industry from reaching a state of complete chaos.

No agreement should be made which does not preserve the cardinal principles of individual liberty. Why should not the relationship between employing contractor and the journeyman be upon a business basis? This view of the question is now held by many of the foremost builders of the country. There is a basis, normal and reasonable, upon which peaceful and harmonious business dealings may be established, and this can only be reached by calm and thoughtful counsel.

Compact organizations among the building trades employers is essential, first, trade associations, each dealing with the journeyman of its branch upon the question of wages and hours; then, the central body, comprehending all branches of trade, supporting the fundamental principles which should govern every builder in his dealings with labor.

Any movement in this industrial period, which has not as its basis of action an intelligent understanding of the economic questions involved, and which does not aim to solve its problems along the lines of reason and justice to all men, whether employer or employe, becomes a menace to our institutions. Economic laws must be respected, lest we enter upon a period of industrial destruction. (Applause.)

Toastmaster Eudaly: We are all very much in the dark as to what will follow, it is down on the programme "Mud Pies," but dear only knows what it will be. I have the pleasure of introducing the very Honorable Wm. D. Gates of Chicago, Ill. (Applause.

S. C. BRUSH, Buffalo, N. Y.

MUD PIES.

By W. D. Gates, Chicago, Ill.

Mr. Toastmaster.—Really I don't know just which way to face. "I don't like to get too far away from the "world power." Ladies and gentlemen, I think it was some two or three months ago, as I was starting for the South, down where the oysters are waiting to be opened, down where the salt waves of the gulf sing to you on the shore, down where the salt breezes blow through the tossing tassles of the pines—oh, I guess we had better cut that out, we have heard that before. As I said I was going down South. Just as I got on the train, I was handed a letter from our very efficient Secretary, which I will read you. "Mr. Wm. D. Gates. Dear Sir. Your subscription to THE CLAY-WORKER is seven years in arrears." (Laughter.) Dear me, that is very annoying, I must have picked up the wrong letter. A voice: Better turn it upside down, Gates. (Laughter.)

Mr. Gates: Sorry I can't quote you from the exact letter, this is very annoying to me I assure you. Anyway, Randall said in his letter that we were going to have a Convention down here in Cincinnati and there would be the usual banquet and that I would be called upon for a strictly impromptu speech. He said "Mr. Eudaly is going to be toastmaster and he is going to give you such a send-off, that you will have to think up a few things in the meantime and wave your arms a few times and paw the air to catch up with him." So I can't spring the point that I've had no time for preparation. Of course when I went down there on the Gulf coast I went to sleep. I required rest and quiet to think of this question of "Mud Pies." (Laughter.) You didn't think I was going to refer to it at all. (Laughter.) Well, I think this is a question that is very familiar to us all. A question that is very vital to us. A question in which we are all very much interested, for it touches all mankind. You all know if you have been diligent with the good book that the first dealer in mud pies was the Almighty himself. He took mud and made man and of course when he had made man he took a different material, and took a spare rib (I had never thought of the *rib roast* proposition, it's a new one to me)! I remember hearing of a little boy, who in giving a description of the creation of man, said: "God took the dust of the earth and made man, and he worked and finished him and called him man, and then when he looked him over, he said, 'Oh, pshaw! I can do better than that, and then he made woman." We have all followed this vocation of making mud pies—all but one. I don't suppose there ever was but one man who missed making mud pies. Boys and girls always make mud pies, and Adam, you know, never was a boy. So he missed that part of his education. We have gone on making mud pies in one way or another ever since. There are good pies and there are better pies. I don't know anything about bad pies, I never saw bad pies.

We have taken this clay and mixed it and fashioned it into various forms. Of later years, since we have been attending these annual conventions, we have mixed other things than water with our mud pies and we have grown up from that and have progressed and become more and more educated in our profession. We have mixed other things in, we have mixed brains with this clay and water, and formed it into such shapes that it should be everlasting. Makers of these mud pies have written history that stands for ages. I remember reading just a short time ago (probably would not have remembered it if it had not been a short time ago) of that remarkable woman Hatasu, probably as remarkable a woman as ever lived. She lived sixteen centuries before Christ and was the new woman of that period. She wore the visible sign of authority and she wore it well. When Hatasu got up in the morning she put on the trousers and went out to business and I opine that Mr. Hatasu had the beds to make and rooms to sweep, etc. Hatasu built for herself a magnificent temple. She had an idea she would hand her name down to posterity in a manner in which there could be no doubt. She built a great temple with a court in front fifteen hundred feet long, lined with great sphinxes on each side, and she carved her name all over this temple so that the people who came there to worship her must see her name, and her father's, for she revered her father. She died and was succeeded by a king and the very first thing he did was to wipe out Hatasu's name where she had written it and inscribe his own. In Babylon in those times the people not so prominent as Hatasu were making mud pies in octagonal slabs, and the baker and grocer took slabs of clay and kept their accounts on them. And the lover when he wrote to his girl, wrot on a slab of clay; it was a sort of a mud pie, and dispatched it to her; and she wrote one back, and they didn't throw them away, but when the courtship had passed, they gathered them together and built themselves a house—a long courtship meant a big house, and a short courtship meant they couldn't have a very big house. One convenient thing about this proposition was, that in later years, if the heads of the family should get into a little family jar, the lord of the house could take his "world power" by the ear and lead her over to one corner and show her some of the things she had said to him in the days of courtship, and she could dig out a brick on her side of the house and show where he stood early in the engagement. Now they are digging up those slabs of clay and getting all those grocery bills. I don't know whether love letters keep that long or not, I haven't had sufficient experience, but I think they keep, they may get mouldy but they last. These things have lasted, while the temple which Hatasu made of stone has gone.

A long time ago a band of travelers journeyed westward, further and further, ever westward till they reached a place where the white man had never trod. The little party wandered westward over hills and valleys, and pressing on and on, finally came out on the plains and canyons of Arizona. One of the places in this section where the hand of time is stayed, they went up the side of a little cliff and found the remains of one of the cliff dwellers' buildings, up against one of those rocks where men had not gone for ages, they found the work of the clayworker, the early mud pie builder. The walls were built of clay and stone and plastered with clay and there on one of those walls the explorers found the imprint of a child's hand which had been held there all these centuries. The little child had grown up and died and his ashes were scattered. Sixteen centuries had wiped out every vestige of Hatasu except just enough to hand down her name, but the bricks of Babylon, the clay and mud pies of Babylon, the clay that held the imprint of the little hand of the child, had held there all these centuries, the mark that was pressed upon them. We are all mud pie makers, we are believers in the greatness of our art, we are putting the impress of our hands on mud pies today, we are putting the best we have, the best we know, in mud pies today and building houses and monuments and temples that will stand imperishable in the future. (Loud applause.)

Toastmaster Eudaly: I have very great pleasure I assure you in introducing the next speaker, hom most of you I believe know. He will talk to us on "Our Comnetitiors," Mr. J. R. Copeland of Birmingham, Ala.

OUR COMPETITORS.

By J. R. Copeland, Birmingham, Ala.

Mr. Toastmaster, Ladies and Gentlemen:

If there is any one among us tonight who is thoroughly familiar with "Our Competitors" I should judge that he is some one other than a brickmaker from the Sunny South. I fear our worthy Secretary has drafted from the wrong section in imposing myself on you tonight. He ought to know that we "surround" our competitors down South and enlist their aid in "doing the other fellow." If there be any among you here tonight who can look backward with fond recollection when on various and sundry occasions you "surrounded" your "first and only love" to such an extent that one chair was all sufficient for present company and one small piece of chewing gum was more than enough for two, then you can form some faint idea how we down South get so close to our competitors that we come to look on them as friends rather than as enemies in business. Under such circumstances as surround us on this happy occasion, why should we not come "to know each other?" Too many manufacturers in our lines have in the past been too prone to adopt that version of the Golden Rule, "Do others before others do you," and have been too ready to make a price with the short sighted purpose of merely securing the order sought, and which in many cases has established a price below the average cost of production, not only of his neighbor's product but of his own also.

Mr. Toastmaster, I believe that we will "come to know one another" more and more and better and better with the frequent repetition of such happy conditions as the present. Meetings like this beget mutual confidence, and underlying the whole scheme of civilization is the confidence men have in each other—confidence in their honor, confidence in their integrity, confidence in their future! The Indians had the Ohio—"Beautiful River" which near by where we now stand rolls on to meet the "Father of the Western Waters." So were the hills and mountains of Tennessee and of my own great State of Alabama filled with mineral treasures one hundred years ago. The same kindly seasons came and went, the same fruitful soil covered the hills and valleys, the same ripening sunshine beamed from heaven, but the man who was here then was the independent, individual, self-seeking savage, pursuing the pathway of war through the trackless forest; and the "Beautiful River" bore no living thing except the Indian in his bark canoe bent on destruction of all "competitors." There was no business co-operation because the Indian was an independent savage who did not understand the principles by which men aid rather than destroy each other, and by which they become cooperators rather than competitors. The basis of civilized and profitable competition in human confidence which makes us rather cooperators than competitors in the strict sense of that word. Anything which attacks that basis of human confidence is a blow against social order and business progress. I believe that the very essence of business success is mutual interest, mutual forbearance, mutual co-operation. I believe that the world has passed the time when there is any real or apparent necessity for the hands of business competitors to be at each other's throats. Any man who believes in that sort of business policy is as out of place now as a North American Indian would be at the head of the municipal government of this great city

Mr. Toastmaster, I drink tonight to the health, happiness and prosperity of each and every one of us at this banquet board who has come to know not only his "competitors" but his own business affairs so thoroughly that he is at all times so posted as to the brick machine and brickmaking business in general and his own business in particular, that he can at all times intelligently insist on a legitimate and living profit which is due him as the just reward for his time, labor, energy and capital invested. To each and every one of these, I say again—"Come, let us know one another!" (Applause.)

Toastmaster Eudaly: Ladies and Gentlemen.—I very much gret that I am compelled to announce that the Vice-Mayor of this city, the Hon. H. L. Gordon, has been detained in Columbus on very important business. We had hoped up to the very last moment that he would be with us, but he is unable to come. We are also sorry to announce to you that Mr. W. W. Taylor, of the Rookwood Pottery, cannot be with us on account of ill health. Prof. C. F. Binns of Alfred, N. Y., has consented to offer a few remarks in the place of Mr. Taylor.

The subject assigned Mr. Taylor was "Fragments," and we will be very glad at this time to have Mr. Binns tell us something about "Fragments," it is a subject with which potters are intimately acquainted.

FRAGMENTS.

By Chas. F. Binns.

Mr. Toastmaster, Ladies and Gentlemen:

I regret that it is impossible for me to adequately represent Mr. Taylor, but for one thing I am glad he is not here. I propose to say a few words presently about him and his associates which I would not care for him to hear. When I saw Mr. Taylor this afternoon he said that it would be quite out of the question for him to speak and sent a note to Secretary Randall to that effect. I, in guileless innocence handed this note to the addressee, only to find myself an unsuspecting victim. This to my sorrow and yours.

The first time I had the honor of addressing this company was in the year 1899 at Columbus. I then ventured upon a prophecy—usually a dangerous thing to do—an interesting domestic function had taken place that day, and the prophecy was to the effect that the infant who had then seen the light would make its voice to be heard.

The fulfillment has come, Mr. Toastmaster. Today the literature emanating from the American Ceramic Society is being eagerly sought by libraries all over the country, is being translated into many tongues and republished in many lands, and is rapidly becoming the most important source of information upon the science of clayworking to be found in the English language.

This week another recognition has been accorded the Society. A man of high repute in the world of science, holding an important position at Washington in one of the Government laboratories, had prepared a paper upon a new theory of clay constitution. He had been solicited to present this before one of the well known societies for the advancement of pure science, but he declined. He preferred, he said, that the men who were bringing scientific light to bear upon the problems of clayworking should first hear of the theory. This was accordingly done, and the Society listened to an admirable presentation of this new subject, constituting one of the most important contributions ever made to the literature of ceramics.

J. R. Copeland, Birmingham, Ala.

In this connection I cannot refrain from pointing out that the success of the Ceramic Society may be attributed in a very large measure to the foresight, zeal, and industry of Professor Edward Orton and your fellow townsman Stanley G. Burt.

Much attention has been devoted of late, in the educational world, to the efforts made on behalf of children who are both deaf and blind. There is but a single sense, that of touch, by which they can be reached, and a recent writer spoke of the task of the teacher, as that of approaching a mere lump of breathing clay, and developing therein a living soul. The man who makes even the commonest brick or tile, does work analogous to this. He takes a lump of clay, which does not even breathe, and produces from it an object of strength, utility or beauty.

In your presence tonight, and in this noble city, I wish to say a word with regard to the pottery produced by Mr. Taylor and his coworkers. He himself would be the last man to desire to disconnect himself from those who are associated with him in the work. But first if you will pardon a personal allusion and knowing that I am about to make a strong statement, I wish you to know that my enthusiasm for pottery is not the birth of a day or a year. I wrote my first essay upon the subject in the year 1870, and I well remember when I took it to my honored father, long since gone to his rest, how his eyes glowed at the thought that I should follow him in the pursuit of his beloved art. That following during the whole of my life, has been, of feeble and afar off, yet consistent. For over thirty years I have studied factory products and the contents of museums in both Europe and America. As a further preface, I wish to make a definition. Faience and porcelain occupy two great divisions in the ceramic field, and must not be compared. For example, one man may make fine brick, another fine terra cotta, but they do not compete against each other, neither does one compare a blood horse with a pedigree, or pit a rose against a carnation. Further, the ceramic productions of bygone days are not to be judged by the light of their own imperfect knowledge, but considered in relation to modern standards.

Rookwood pottery is faience and I do not compare it with porcelain, but this I say and say deliberately, that you may search the wide world in ancient or modern times without finding its parallel. In technical ability, in executive perfection, in artistic grace, the pottery produced on Mt. Adams today excells not only its contemporaries, but also the work of any other age.

Mr. Toastmaster, this is a strong statement, and I know it, but it is no hasty judgment, and I am prepared to maintain it before any competent judge. I have studied this ware since 1889, and have found a steady and constant advance in the quality of the work, and I doubt not with the forces at the disposal of the executive and the enthusiasm and wisdom of the guiding hand, that there lies before the Rookwood pottery even greater triumphs in the years which are to come. (Applause.)

Toastmaster Eudaly: The train which carries one of our very honored members from us, will leave in a very short time, and we would like to hear from him before he goes, and then we have a large list of requests that has been sent up here for certain gentlemen to be heard from. I do not know whether we will have time to hear from all these gentlemen or not, but will be very glad indeed now to hear from our first Vice-President, Mr. J. M. Blair, of this city, whom I had the pleasure of introducing to you this afternoon.

Jefferson Middleton, Washington, D. C.

Mr. J. M. Blair: Mr. Toastmaster, Ladies and Gentlemen.—I am reminded tonight that on the 22d of September, 1886, in this city and in this house, I called to order a group of less than fifty brickmakers of the United States, representing nearly every State in the United States, and organized the National Brick Manufacturers' Association. I had no idea at that time that this organization would attain the proportions it has. You have erected in the last eighteen years a structure that will live. We have tried to indicate in the badge that we have presented to you, the erection of a column, the first brick of which was laid in 1886. You come today and put the finishing touches on that column, but it is only one of the columns of the entrance way to that great structure which you are to erect in the future, which will grow with the strength of your organization. It was my good pleasure at one time to have been affiliated with the National Association of Builders. We thought at that time that there was no greater organization than that in this country. But I am sorry to say that today it is not in the prosperous condition of the National Brick Manufacturers' Association. And why? Because the management, or extravagance, or something led the affiliated bodies to withdraw from the National body. You have started on the right plan and I do hope that you will continue and that when you meet in Cincinnati again, instead of being ten times the number you were when you first met here, that you will be fifty-fold in numbers, and that the representation in wealth will be millions. I met a friend of mine, a traveling salesman, a few days ago, and he said to me, "It's getting monotonous this traveling around over the country and being called at unseasonable hours of the night to make trains. I'd like to have sufficient of the filthy lucre for just one purpose." And I said, "What's that?" He said, "Well, I'd go over to the St. Nicholas and order one of the best rooms they have got, and then I'd leave a call for 6:30 in the morning and I would retire and forget all my troubles and when the porter came to call me at 6:30 I'd tell him to go to ——, I didn't have to get up." (Laughter.) I know the trials and tribulations in your business, I have gone through them all, I know the labor troubles, the transportation troubles, increase in the price of fuel, bad burns, poor collections and the many obligations to be met, etc., and I do hope that every one within hearing of my voice, will be able to obtain a competency sufficient to say when all these troubles come, "I don't have to." That is all I wish. (Loud applause.)

Toastmaster Eudaly: There are still some others that I have been requested to call upon. I could read the list, but that would only prompt the request for others. I now have the pleasure to introduce Mr. D. V. Purington of Chicago.

Mr. D. V. Purington: I am only going to talk a few moments and I'm going to make a little bit of a confession, going to make it for two reasons. First, because I was called upon, and second, because my conscience prompts me to do it. For years there has been a little after dinner speakers' trust in this Association. It has not really been found out. But those of you who will go over the proceedings of the annual banquets, will discover that four men have been in this trust. Two of them will speak one year and then two the next, and they are Mr. Randall, Mr. Gates, Mr. Eudaly and myself. Last year it was Gates and Randall who were to speak. Gates went down to Alabama and I had to make a speech for him. It is not my turn tonight and I told Mr. Eudaly when he said he was going to call upon me, that he was violating the conditions of our trust. Mr. Eudaly said that, Rip Van Winkle like, he wouldn't count tonight and that I had to make one of the two, and that is why I got up to make this confession. If you'll follow this thing up you will see that these four men, two of them make a speech one year and two the next, and sometimes they would alternate. I had no business to be on it tonight. Mr. Eudaly has made his speech and Mr. Gates has made his, so Mr. Randall and I should have been left out. (Applause.)

Toastmaster Eudaly: You can readily understand Mr. Purington's remarks, when he said that sometimes we would alternate, that was so you would never catch on, and I am sure you never have. I am not altogether to blame, the truth is Brother Purington forgot his manuscript and didn't have time to prepare another speech and I won't stand for this. But it's all right, he will stand for it next time and if his wife revises it as she always does, it will be a good one, and that will be Purington's regular turn. I take great pleasure in introducing to you one of the great educators of a neighboring State, Prof. Ira O. Baker of Champaign, Ill.

Prof. Ira O. Baker: Mr. Toastmaster, Ladies and Gentlemen.—Two men were sitting on a hotel veranda and one asked the other, "Are you a guest of the hotel?" The reply was: "Well, I guess not, I pay cash." (Laughter.) I supposed I was the guest of the Association tonight, but apparently I must pay for my entertainment. However, if I pay, you also will have to pay—or get up and go out.

I am glad to be here and am pleased to have an opportunity to express my admiration of the work this Association has accomplished It has given an entirely new meaning to one building material that is older than history itself, and has created another material that has already added greatly to the comforts of civilization. Further, I am very glad to testify to the pleasure I have had today in meeting the members of this Association. I greatly admire the broad-minded and generous spirit that seems to actuate the Convention, and particularly the attitude of the members toward their competitors and their laborers. It has all been very delightful to me, and I think that the spirit of fairness and justice that I have seen manifested by all, promises well for the future of this Association and for all in any way connected with it.

But what interested me most in the proceedings of the Association today was the attitude toward scientific and technical investigation. A good deal could be said justly in commendation of the Association's interest in such matters, and more could be said with equal justice of the advantage that has accrued to the members of this Association through the prompt utilization of the results of scientific investigations.

These things prompt me to get even with the toastmaster by grinding my own axe. I rejoice that I am a teacher, and I ask your attention to some things that are very dear to my heart. I recognize the fact that you are business men and that in your vicinity you have considerable to do in molding public opinion; and knowing your interest in technical investigation, I ask your sympathy for the interests of industrial education.

For the past few years our newspapers and magazines have had much to say about our rapidly increasing foreign trade, chiefly in the way of recording its marvelous growth, but with little attention so far as I have noticed, to the factors that make such success possible. Of course, such a result depends upon many elements, among which are: (1) The peculiarities of our national ancestry, which has peopled this country with the brightest minds of all nations; (2) our political constitutions, which make it possible for the humblest to rise to the highest position; (3) the fact that we are a great nation, speaking one language, with no barriers in the way of the freest social and commercial intercourse; (4) our great and varied natural resources of mine, forest and soil; (5) the high price of labor, which stimulates the introduction of labor-saving machinery; and (6) the general dissemination of education, which made possible the effective use of labor-saving machinery and permitted the nation to profit by the capable and ambitious workers of all classes.

But we have recently entered upon a new phase of national and industrial life. Until now we have been engaged in subduing the great West, in establishing homes, in founding cities, in building railroads. By legislation we barred out foreign competition and preserved the home market for our own products; but now the new land in the West is occupied and there is no longer an outlet in that quarter for our surplus labor, and our industries have outgrown the home market. If prosperity is to continue in the future as in the past we must have new markets, and in these markets we must meet the competition of the world. What are the conditions necessary for success in that field? The recent commercial history of Germany and Great Britain is significant.

For many generations Great Britain was pre-eminent in manufactures and in commerce. In 1870 she did one-quarter of the world's business, and the English believed that their industrial supremacy was secure; but in a single generation they have waked up to the fact that they are rapidly losing ground and in some respects are already third in the race. With Germany the almost exact reverse is true. Thirty years ago she had a comparatively unimportant place in the commercial world, but in a single generation all this has been changed. The power employed in manufacture has increased four times as rapidly as the population, and the tonnage of the ships engaged in foreign trade has increased tenfold. From 1870 to 1895 German foreign trade increased 42 per cent., while the English increased only 13 per cent.; and from 1895 to 1900 German foreign trade increased $200,000,000, while England's increased only $30,000,000. Why is it that Germany, with one of the poorest seaboards in the world, with a poor soil and with a dangerous military position, has been able in a single generation to outstrip England—the mistress of the sea and the foremost manufacturing nation of the world?

The recent marvelous industrial development of Germany was coincident with, and dependent upon, the development of industrial education. About thirty years ago Germany reorganized and strengthened her technical schools and established many new ones, until now the provisions for technical education is the wonder and admiration of all who know the facts. In the number and equipment of her technical schools Germany leads the world. She is fully alive to the commercial importance of scientific investigations and technical education.

After vainly endeavoring to convince herself to the contrary, England is ready to admit that she is being distanced in the industrial and commercial race, because she has not kept alive to the intimate relation between science and industry, and that in neglecting the technical education of her people she has failed to train her industrial army. In these days of sharp competition and small margins, when the entire world is in the market, the nation that most carefully trains its industrial army will gain industrial supremacy. Of course, there are other factors, as wages, labor unions and tariff; but not one of them has such transcendent importance as that training of the individual which enables him to produce the most in the least time and at the smallest cost. The English now realize that they have made a mistake in failing to recognize the difference between the skilled workman and the technically trained man, and in not providing for the education of the latter. They are now awake to their mistakes in the past and have set about making amends.

What is the lesson for us? It is that if this country is to extend or maintain its foreign trade it must look carefully to higher technical education. We already have a goodly number of technical colleges, but in number and equipment they are inferior to those of Germany, although in method they are better adapted to American conditions than would be the German type. Most of our technical schools are in need of additional equipment and more instructors. Technical education in this country was inaugurated about thirty years ago, and the engineering education given now is vastly better than that of twenty-five years ago; but there is still opportunity for improvement. The one thing necessary is adequate financial support. Technical education, especially engineering education, is very expensive. A large and costly equipment is required, and machines and apparatus wear out or become antiquated and must be replaced by new. Our technical schools need a more generous support, so that they may add to their facilities and extend their courses. Any money given for this purpose is wisely expended, for experience has abundantly proven that money given to technical education is returned many fold in the increased productiveness of the nation's industries. A single example is sufficient. Thorough scientific investigation and experiment the amount of sugar obtained from a ton of beets in Germany has increased more than twofold in a single generation, and the amount of money that that investigation returns to the nation in a single year is many times the cost of all the scientific investigations carried on in that country during the last thirty years.

To be most effective, technical education must be practically free. Unless it is so many will be debarred from its privileges, and society will be dependent upon a few workers from a favored class. One of the main reasons why this nation has been so prosperous in the past is that education has been free, and consequently the higher ranks have been continually recruited from the lower. The way should be opened that the humblest may rise from the lowest to the very highest rank. Education should not be bestowed as a charity, nor as a means for helping the recipient to earn a livelihood, but because the proper education of the people is the only basis for social security, economic prosperity and the highest national development. The conclusion almost certainly follows that only the government has the ability to make provision for the adequate technical education of the people. The Federal Government and the States, particularly the north central ones, have made magnificent provisions for technical education; but the numbers seeking it require increased equipment, and the change in industrial life demands a higher grade of work.

I ask you as business men carefully to ponder over these things, and to give your assistance and sympathy to the industrial education of the youth of this country, so that we may not in another generation find ourselves in the condition England now is. We probably will never export brick, but we all move forward together and anything that builds up the country generally helps each individual in it.

Chas. Bonner, Chicago, Ill.

Will you each, then, in your own way, in your own city and State, as opportunity offers, use your influence to create a public sentiment favorable to the adequate support of technical education, so that the youth of our country may receive the best possible training. Nothing will develop the resources of our country more grandly. Only through the education of the masses may we become truly a world power. (Applause.)

Toastmaster Eudaly: There is a gentleman here who does not belong to any clique of toastmasters or after dinner speakers, he don't belong to anything or anybody, except his wife and business. You will now know at once to whom I refer and it gives me pleasure to introduce my friend and your friend, Mr. Jno. W. Sibley, of Birmingham, Ala.

Mr. John W. Sibley: Mr. Toastmaster, Ladies and Gentlemen,—I was taken quite by surprise by the introduction of the toastmaster. Mr. Randall came over a little while ago and said for me to put up my lightning rod for I was going to be called upon, but I took it jocosely. I think in following out the magnificent suggestion of Brother Melish about the "World Power," that if I would just make one or two suggestions, especially to the younger members present of the male sex here tonight, it would not be amiss. A great many of our members, including myself, have already surrendered to one of the "World Powers," but I see a great many of the "World Powers" that have not yet been pre-empted, and that reminds me of a story of a wounded soldier, during the siege of Parkersburg, Va. As he laid upon his cot suffering, an angel of mercy in the shape of a beautiful Virginia girl, passed through the hospital and stopped and asked if there wasn't something she could do for him and he said no, he had been so badly wounded that death would relieve him of his sufferings in a short time, and she said, "Can't I pray for you? I'm sure I am one of the Lord's daughters and I'm sure I can help you." And he said, "Yes, pray at once and ask the Lord to let me be his son-in-law." (Laughter and applause.)

Toastmaster Eudaly: I know very well that you have been well entertained by this music and the toasts and the great amount of excellent advice you have received. I have never seen a time in the history of our Association when the ladies seemed to be so well pleased and so well paid for their attendance and I think justly so. I am very glad indeed that Brother Melish gave us this very excellent advice. I am also very glad indeed that the attention of our Association has been turned in the most favorable way toward the ladies and that we will make more of this feature of our annual gathering, and in the future I am also sure that after this evening they will make considerably more of us. I have a sort of a time thermometer here at my side who "rules me as she will," and I am advised that the time has come when I must declare this meeting adjourned, and so we will ask the orchestra to play "Auld Lang Syne."

IN THE EXHIBITION ROOM.

Many Attractive Displays and Those Who Made Them—Up-to-Date Machinery, Kilns, Dryers, Yard Supplies and Improved Appliances Shown.

THE BUSIEST PLACE in Cincinnati Convention week was the Exhibition Hall, while more room might have been utilized had it been at the disposal of exhibitors, there was enough to accommodate comfortably all who asked for space. Every desirable convenience was afforded, and there were fewer "kicks registered" than on any previous occasion. Notwithstanding the fact that the Exhibition Room was uncomfortably close to the Convention Hall, no serious inconvenience was occasioned; the sessions of the Convention were well attended, and the entire arrangement seemed to be as satisfactory to all concerned as can be hoped for this side of the millennium.

The convenience of the Exhibition Room, being a part of the hotel lobby, proved a decided advantage to all exhibitors. Probably at no previous convention has exhibits been subject to such careful inspection by all visiting delegates. The displays appeared to be lodestones which drew the members to them irresistibly. In some instances, perhaps, the attraction was the pretty souvenir gifts which were generously distributed by several of the "missionaries."

The American Clay-Working Machinery Co., Bucyrus, Ohio, was ably represented by Mr. Reehl, L. W. Penfield, Ed. Callaway, and J. J. Gledhill, some of whom were on hand at all times to answer inquiries in regard to their "Built right, run right" machinery. Their display consisted entirely of trade literature.

C. & A. Potts & Co., Indianapolis, Ind., was represented by Albert Potts, who distributed catalogues and other printed matter telling of the Potts disintegrators, stock machine and sand molding machine and other brickyard supplies, freely to all comers. It was rumored "along the lines" that this firm will soon offer the trade a line of sand-lime brick machinery.

The Horton Mfg. Co., Painesville, Ohio, was represented by the senior member of the firm, C. H. Horton and Mr. D. H. Prosper, neither of whom seemed to grow the least weary in telling of the merits of their Hercules Special Brick Machine and other supplies for soft mud and fire brick manufacturers.

The Arnold-Creager Co., of New London, and Cincinnati were represented by Mr. D. J. C. Arnold and Harry Creager, and those who were seeking information relative to the Grand Automatic, the "S. S. S." soft mud machines, etc., were given distinguished attention.

The Cleveland Car Co., West Park, Ohio, made one of the largest and most attractive displays under the direction of Mr. W. E. Ellenberger. A variety of steel and iron cars used by brick and tile manufacturers were shown to advantage.

H. Huennekes Co., 114-118 Liberty St., New York, contractors and engineers for the construction, equipment and operation of sand-lime brick factories, made a very handsome exhibit of sand-lime brick. There were few idle moments for Mr. Babb and his associates, and the interest manifested in this exhibit was ample proof of the general desire for information about this new product.

The Bonnot Co., Canton, Ohio, were generous in the distribution of printed matter, setting forth the advantages of their stiff clay brick and tile machinery.

The United States Sanitary Co., Washington, D. C., exhibited a full size model of their "Winner" clay screen, and made a very effective display. Their neighbor, Messrs. Kendall & Flick, represented by the senior member of the firm, joined hands in the distribution of printed matter. The latter's booklet dwelt on the value of manganese as used by front brick manufacturers.

Chambers Bros. Co., Philadelphia, Pa., were to exhibit a full size cutting table, but found the machine too heavy for the marble floor, so contented themselves with the display of a small model machine and the distribution of trade literature. Among the latter was a handsome brochure entitled, "Ye Historic Views of Olde Philadelphia." It was prepared especially for the occasion and made a very pretty Convention souvenir.

The Scott Mfg. Co., Keokuk, Iowa, had a small but interesting exhibit, to which W. F. "Dixie" Scott lent the charm of his personality, losing no opportunity to sing the praises of the Andrus brick press.

The Chicago Brick Machinery Co., Chicago, Ill., represented by the inimitable J. J. Moroney, joined issues with the Anderson foundry and Machinery Co., Anderson, Ind., and with the assistance of W. N. Durbin, the affable, told effectively of the merits of the Berg press, and the success of the sand-lime process as conducted by their patrons. Their exhibit included a number of fine front brick made by the new process under the system of the American Sand-lime Brick Co.

W. A. Eudaly, Cincinnati, exhibited working drawings of his round and square down draft kilns, so well delineated that they told their own story.

The Standard Dry Kiln Co., Indianapolis, displayed a very attractive line of trade literature which tells in a convincing way the advantages of drying brick by steam heat. Mr. Robert Elliott, the founder of the business, was on the ground in person and gained a reputation for industry among his associates. Robert is not only a hard worker but an effective one.

The Atlas Car & Mfg. Co., Cleveland, Ohio, exhibited a number of dryer cars, turn tables, switching tracks, etc. S. D. Wright and S. A. Williams vied with each other in extending the glad hand to their many friends and patrons.

Chisholm, Boyd & White Co., Chicago, Ill., through their talented general manager, H. J. Flood, made a modest but very effective exhibit presenting visitors with their beautiful catalogue, which is indeed a handsome publication, being beautifully illustrated with views of Boyd presses of varying sizes and capacities.

The J. D. Fate Co., Plymouth, Ohio, not only displayed a good line of trade literature, but presented visitors with a beautiful souvenir, match and stamp case, which was in great demand and made Mr. Fate a much sought after individual.

The Fernholtz Brick Machinery Co., St. Louis, Mo., exhibited some excellent brick made on their presses, and distributed catalogues graciously to every comer.

The Ohio Ceramic & Engineering Co., Cleveland, Ohio, extended a cordial welcome to all comers, presenting each visitor with their catalogue illustrating the Richardson represses, brick cars and other brick yard equipment, which has gained them name and fame among brickmakers the country over.

The Gemmer Engine & Mfg. Co., Marion, Ind., were represented by J. W. Rust, who seemed delighted to exhibit a model of the Rust Clay Feeder. This is a new device, which is attracting much attention among those looking for improved appliances and labor saving devices.

The Wellington Machine Co., Wellington, Ohio, made a fine display of their ball bearing trucks and barrows. The redoubtable Chris. McDermott was in charge, and never wanted for company throughout the week, being one of the first to arrive and among the last to depart. He was ably assisted by J. W. Hensley of Indianapolis, and

R. C. Bennett of Wellington, both of whom grow eloquent on the merits of Monarch and Quaker machinery on every occasion. Their visitors were presented with a useful memorandum book.

The Main Belting Co.'s interests were well looked after by F. S. Thompson, a pioneer in the field, and Mr. E. P. Foster, both of their Chicago office. They exhibited samples of belting and good fellowship, which are never excelled and rarely equalled, throwing in for good measure an elegant souvenir pocketbook.

The Wallace Manufacturing Co., Frankfort, Ind., through their general manager, H. L. Hix, and his able assistant, W. G. Cramer, did some effective missionary work for their line of Wonder brick machinery, distributing a large number of their handsome catalogues.

The Henry Martin Brick Machine Manufacturing Co., Lancaster, Pa., exhibited photographs of their famous machines and brick yard supplies.

The Thew Automatic Shovel Co., Lorrain, Ohio, made a fine display of photographs of their shovels as seen in actual operation. Their genial representative, F. A. Smythe, seemed to have little trouble to convince seekers after steam shovel information of the great advantage of their method of handling clay and shale.

The Dunlap Mfg. Co., Bloomington, Ill., was ably represented bv O. W. Dunlap, who "handed out" a cordial greeting and effective trade literature telling of the merits of the "Perfect" Clay Screens. Most of his friends and visitors also carried off a substantial token in the form of a pocket match box.

Arthur Koppel, dealer in railway materials, 66 Broad Street, New York, exhibited a large line of dump cars and railway materials. His indefatigable representatives, Otto C. Plessner and Charles Lammerholz, were kept very busy explaining the variety of equipment included in their extensive line. Theirs was probably the largest individual exhibit.

D. M. Warner, Sparta, Mich., exhibited a working model of his perfect open air system of handling and drying brick. The simplicity of his method appealed strongly to every visitor.

The Champion crushing machinery made by the American Road Machine Co., Kennet Square, Pa., was effectively represented by Mr. C. F. Monfort, who seemed to enjoy telling clayworkers how they can save time, money and wear on machinery by the use of a Champion crusher in connection with dry pans, etc.

Robert Goodwin, Jr., Redfield, Iowa, lost no opportunity of greeting his old friends from the West (he made many friends while secretary of the Iowa Clayworkers' Association) and making new ones. He is now offering the trade an improved system of drying brick, known as the hot floor heating system, the merits of which were fully set forth in an attractive catalogue.

H. C. Dunn, Erie, Pa., the veteran continuous kiln advocate, was on hand with his tiny shovels which are convincing proof of the small amount of fuel that is required to operate the Dunn kiln.

Ricketson's Mineral Paint Works, Milwaukee, Wis., made an effective exhibit of their mortar colors, and distributed a neat souvenir catalogue.

S. H. Alsip, Belleville, Ill., lent his presence to the occasion, and was ever ready to explain in detail the modus operandi of the Alsip coking table furnaces.

The Robinson Clay Product Co., Akron, Ohio, was well represented by Mr. P. T. Robinson, who quickly became very popular by generously distributing packs of celluloid playing cards, an elegant souvenir.

The Sharer Dryer and Kiln Co., Philadelphia, Pa., was much in evidence. A neat catalogue telling of the merits of the Sharer system was distributed freely.

The Laclede Fire Brick Manufacturing Co., St. Louis, Mo., exhibited some excellent fire brick. Their representative, Mr. Fred Talbott, made a host of friends, and gave to those who were interested a handsome pocket catalogue. This was Mr. Talbott's first, but it is a safe prediction that it will not be his last convention.

E. M. Freese & Co., Galion, Ohio, were represented by the senior member of the firm, Mr. E. M. Freese, and B. E. Place, neither of whom made an undue amount of noise, but their friends and patrons knew they were there, and those who were looking for information relative to the merits of Freese machinery and were made happy.

H. Brewer & Co., Tecumseh, Mich., were in evidence. Charles Burridge, the irrepressible, treated his host of personal friends with the smile that won't come off, and a handsome catalogue.

Madden & Co., Rushville, Ind., were represented for the first time by the junior member of the firm, Mr. S. E. Madden, who proved an able exponent of "Hoosier" brick and tile machinery.

The American Blower Co., Detroit, Mich., distributed a fine line of trade literature, telling of the merits of their well known system of waste heat dryers. Their new catalogue, which is a beauty, gives special attention to this branch of their business. Those not fortunate enough to have obtained a copy at Cincinnati are requested to write them for one.

J. C. Boss, Elkhart, Ind., inventor of the Boss system of brick burning, was a conspicuous figure in the annex, and told the story of the Boss method of burning common brick in a modest but very convincing manner.

A. M. & W. H. Wiles Co., Grassy Point, N. Y., through their agreeable representative, Frank E. Wiles, let the visitors know that they were still doing business at the old stand turning out soft mud brick machinery for the Hudson River brickmakers and the world at large, as well, when given an opportunity of doing so.

Hervey Haigh, Catskill, N. Y., of continuous kiln fame, was kept busy exchanging greetings with old friends, but found time to answer all inquiries from new members. Mr. Haigh is one among the few of the "missionaries" who never misses a session, and yet seems to have plenty of time to devote to the Exhibition Hall. We have a well defined idea that a number of his colleagues might profit by his example.

The Roessler-Hasslacher Chemical Co., 100 Williams St., New York, N. Y., dealers in chemicals for clayworkers, was, as usual, represented by Carl E. Trommer, whose good fellowship has made his name a by-word among the faithful.

The C. W. Raymond Co., Dayton, Ohio, were represented by the senior member of the firm, who by the way is a charter member of the N. B. M. A. He was ably assisted in disseminating literature of the clay machinery which has made Dayton famous, by his youngest son, George M. Raymond.

The Barron Dryer Co., Chicago, was much in evidence. A. F. Barron, another old timer, lent an attentive ear to those who were looking for dryer information, and presented an excellent catalogue setting forth in a convincing way the merits of the Barron tender clay dryer.

F. E. Swift, of Washington, Iowa, was a familiar figure in the lobby and was ready at all times to impart information about his slack-coal, grateless coking table.

Frederick W. Dennis, Atlanta, Ga., evinced much pride in a model of his up-draft and down-draft kilns and his direct heat drying system.

The Schwarz System Brick Co., New York City, N. Y., had an able advocate in the person of Mr. S. E. Frank, who was ever ready to discourse on the merits of sand-lime brick in general and those made by the Schwarz system in particular.

C. W. RAYMOND, Dayton, Ohio.

There were a number of other exhibitors, each having some particular appliance or scheme of more or less interest to every brickmaker, but notwithstanding their persuasive ways, there was much buttonholing going on continuously, and delegates seemed prone to grow confidential over their brickyard experiences and personal affairs despite the attractions about them, and so doubtless it will always be, for wherever a few brickmakers gather together there is much conversation.

ONE OF THE N. B. M. A. SIDE TRIPS.

As an aftermath to the National Convention of Brick Manufacturers at Cincinnati, an exhibition of Clay Working Machinery in operation was given by The C. W. Raymond Co., at their plant in Dayton, Ohio. About twenty-five brick manufacturers attended.

A plant consisting of the "777" brick machine and rotary automatic cutter, with represses was operated at a rate of 101,400 brick per day—notwithstanding this plant is usually sold on a rated capacity of 50,000.

The quality of the brick turned out by the cutter would compare favorably with the re-pressed brick, and the whole performance of the machinery commanded the admiration of those present.

In addition to this, the firm exhibited a "Niagara" Hollow Ware Machine, showing some of the numerous varieties of dies that could be worked upon it. Also were shown a "999" Brick Machine, a soft Mud Stock Brick Machine and a Nine foot Dry Pan. Altogether making a creditable display of modern machinery.

The day was well spent by those so fortunate as to visit Dayton, as side trips to the National Cash Register Works and Soldiers' Home were enjoyed by many.

LIST OF MEMBERS N. B. M. A., 1904.

Executive Committee, 1904-1905.

President—W. S. Purington, Galesburg, Ill.

First Vice-President—J. M. Blair, Cincinnati, Ohio.

Second Vice-President—W. P. Blair, Terre Haute, Ind.

Third Vice-President—A. R. Root, Princeton, N. J.

Secretary—T. A. Randall, Indianapolis, Indiana.

Treasurer—J. W. Sibley, Birmingham, Ala.

EX-PRESIDENTS.

W. A. Eudaly (1886), Cincinnati, Ohio.
D. V. Purington (1887), Chicago, Ill.
Robt. Speed (1888), Memphis, Tenn.
T. B. McAvoy (1888-89), Philadelphia, Pa.
C. B. Pearson (1892), Washington, D. C.
Anthony Ittner (1893), St. Louis, Mo.
F. H. Eggers (1895), Cleveland, Ohio.
W. H. Brush (1897), Buffalo, N. Y.
Wm. Flinn (1898), Pittsburg, Pa.
W. D. Richardson (1899), Columbus, O.
Wm. D. Gates (1900), Chicago, Ill.
W. H. Hunt (1901), Cleveland, Ohio.
G. M. Fiske (1902), Boston, Mas.
R. G. Eisenhart (1903), Horseheads, N. Y.

*W. H. Alsip (1894), Chicago, Ill.
*R. B. Morrison (1896), Rome, Ga.
*C. P. Merwin 1888-93), Berlin, Conn.
*J. C. Adams (1890-91), Indianapolis, Ind.
*Deceased.

Committee on Technical Investigation.

Prof. Edward Orton, Jr., Columbus, O., (permanent secretary).

W. D. Richardson, Columbus, O., (term expires 1908).

Anthony Ittner, St. Louis, Mo., (term expires 1907).

D. V. Purington, Chicago, Ill., (term expires 1906).

C. A. Bloomfield, Metuchen, N. J., (term expires 1905).

Committee on Louisiana Purchase Exposition, 1904.

Prof. H. A. Wheeler, chairman, St. Louis, Mo.

Jefferson Middleton, Washington, D. C.

Arthur D. Rogers, Boston, Mass.

H. De Joannis, Chicago, Ill.

George J. M. Ashby, secretary, St. Louis, Mo.

George H. Hartwell, Chicago, Ill.

W. S. Purington, Galesburg, Ill.

Theodore A. Randall, Indianapolis, Ind.

Membership Roster.

Chattahoochee Brick Co	Atlanta, Ga.
The Atlanta Terra Cotta Co	Atlanta, Ga.
Fred'k W. Dennis	Atlanta, Ga.
Capital City Brick Co	Atlanta, Ga.
Georgia Vitrified Brick and Tile Co	Augusta, Ga.
George M. Stedman	Aurora, Ind.
Alton Paving, Building and Fire Brick Co.	Alton, Ill.
Anderson Foundry and Machine Works	Anderson, Ind.
Anton Berg	Anderson, Ind.
C. W. Williams	Addington, I. T.
Atchison Paving Brick Co	Atchison, Kan.
D. S. Hildebrand	Asheville, N. C.
Hubert Somers	Atlantic City, N. J.
Charles F. Binns	Alfred, N. Y.
Cincinnati Brick Co	Addyston, O.
Robinson Clay Product Co	Akron, O.
McCausland Bros.	Akron, O.
H. B. Camp	Akron, O.
Samuel Cooper	Akron, O.
A. Hoover (Fultonham Brick Co.),	Axline O.
D. C. Cawley	Allegheny, Pa.
Jas. L. Whyte	Allegheny, Pa.
C. H. Yohe	Alexandria, Va.
W. H. Carter	Appleton, Wis.
J. R. Copeland	Birmingham, Ala.
W. L. Robertson	Birmingham, Ala.
Jno. W. Sibley	Birmingham, Ala.
J. H. Connley	Berlin, Conn.
M. E. Jacobs	Berlin, Conn.
George E. Green	Berlin, Conn.
S. H. Aslip	Belleville, Ill.
Warren Wayne Ittner	Belleville, Ill.
O. W. Dunlap	Bloomington, Ill.
W. H. Swett	Blue Island, Ill.
Granite Brick Co., The	Burlington, Ia.
McRoy Clay Works	Brazil, Ind.
Hugh O'Brien	Brewer, Me.
Brian J. Dunn	Bangor, Me.
Samuel R. Busey	Baltimore, Md.
Baltimore Brick Co	Baltimore, Md.
Jacob Klein	Baltimore, Md.
Chas. Edwards	Baltimore, Md.
E. V. Donelson	Baltimore, Md.
Albert D. Klein	Baltimore, Md.
J. Parker B. Fiske	Boston, Mass.
Geo. M. Fiske	Boston, Mass.
Edward W. Emerson	Boston, Mass.
A. D. Rogers	Boston, Mass.
New England Brick Co	Boston, Mass.
Frank G. Evatt	Boston, Mass.
Parry Brick Co	Boston, Mass.
Spiers-Fish Brick Co., The	Boston, Mass.
Albert H. Gleason	Boston, Mass.
John W. Hahn	Boston, Mass.
Fred C. Lomas	Boston, Mass.
G. S. Burnham	Boston, Mass.
F. L. Fuller	Boston, Mass.
F. L. Wright	Boston, Mass.
A. J. Wellington	Boston, Mass.
Ernest R. Yates	Boston, Mass.
J. Gardner Bassett	Bridgewater, Mass.
Wm. H. Bassett	Bridgewater, Mass.
S. J. Monroe	Butte City, Mont.
Ensign Lumber Co	Binghamton, N. Y.
W. S. Brandt	Binghamton, N. Y.
Edwin Brockway	Brockway, N. Y.
Chas Graham	Brooklyn, N. Y.
F. J. Nash	Brooklyn, N. Y.
G. M. Springer	Buffalo, N. Y.
Wm. J. Leary	Buffalo, N. Y.
W. H. Brush	Buffalo, N. Y.
V. H. Whitney	Buffalo, N. Y.
J. H. Black	Buffalo, N. Y.
Cling-Surface Mnfg. Co	Buffalo, N. Y.
Geo. W. Schmidt	Buffalo, N. Y.
S. C. Brush	Buffalo, N. Y.
P. F. Jamieson	Batavia, O.
George H. Bruns	Brecon, O.
W. W. Reehl	Bucyrus, O.
R. R. Hice	Beaver Falls, Pa.
Reese, Hammond & Co	Bolivar, Pa.
T. M. Berkey	Bolivar, Pa.
M. F. Melvin	Bradford, Pa.
I. M. Justice	Bethany, W. Va.
J. W. Stipes	Champaign, Ill.
George J. Walters	Chatsworth, Ill.
D. V. Purington	Chicago, Ill.
W. D. Gates	Chicago, Ill.
L. E. Rodgers	Chicago, Ill.
Thos. Biehl	Chicago, Ill.
Barron Dryer Co	Chicago, Ill.
H. J. Flood	Chicago, Ill.
Harrington & King Perf. Co	Chicago, Ill.
S. S. Kimbell	Chicago, Ill.
Jno. J. Moroney	Chicago, Ill.
F. Wagner	Chicago, Ill.
J. H. Gray	Chicago, Ill.
Windsor & Kenfield	Chicago, Ill.
Chicago Fire Brick Co	Chicago, Ill.
Frost Mfg. Co	Chicago, Ill.
E. C. Kimbell	Chicago, Ill.
E. A. Glocksen	Chicago, Ill.
L. D. Binyon	Chicago, Ill.
George H. Hartwell	Chicago, Ill.
A. J. Kautz	Chicago, Ill.
D. J. Christopher	Chicago, Ill.
F. S. Thompson	Chicago, Ill.
G. W. Straight	Chicago, Ill.
Herman L. Matz	Chicago, Ill.
H. S. Hopkins	Chicago, Ill.
E. R. Frazier	Chicago, Ill.
W. P. Brennan	Chicago, Ill.
J. J. Gledhill	Chicago, Ill.
C. Bonner	Chicago, Ill.
Thos. Moulding & Co	Chicago, Ill.
H. B. Skeele	Chicago Heights, Ill.
J. W. Robb	Clinton, Ind.
L. C. Besley	Council Bluffs, Ia.
Emil N. Nagel	Clinton, Ia.
Cherryvale Pressed Brick Co	Cherryvale, Kan.
Alv. Satre	Coffeyville, Kan.
The Busse Brick Co	Covington, Ky.
A. Meier & Co	Covington, Ky.
Walter Clark	Clarksdale, Miss.
I. C. Wheeler	Carthage, Mo.
Henry Paupe	Cumberland, Md.
Hervey Haigh	Catskill, N. Y.
M. E. Gregory	Corning, N. Y.
J. L. Higley	Canton, O.
The Bonnot Co	Canton, O.
The Cleveland Brick Co	Canton, O.
G. B. Willis	Canton, O.
F. T. Zollinger	Canton, O.
Mitchell Brick Co	Cincinnati, O.
W. A. Eudaly	Cincinnati, O.
S. G. Burt	Cincinnati, O.
F. Henry Angell	Cincinnati, O.
Henry Wuebker	Cincinnati, O.
The Westwood Brick Co	Cincinnati, O.
Suer & Bros	Cincinnati, O.
E. F. Gray	Cincinnati, O.
Chas. Taylors Sons	Cincinnati, O.
L. P. Hazen & Co	Cincinnati, O.
J. M. Blair	Cincinnati, O.
F. E. Swift	Cincinnati, O.
A. A. Davis	Cleveland, O.
Spencer M. Duty	Cleveland, O.
C. B. Stowe	Cleveland, O.
Ohio Ceramic Engineering Co	Cleveland, O.
F. H. Eggers	Cleveland, O.
H. C. Bradley	Cleveland, O.
Dover Fire Brick Co	Cleveland, O.
C. M. Bassett	Cleveland, O.
C. S. Bigsby	Cleveland, O.
Geo. S. Hanford	Cleveland, O.
John Wilson	Cleveland, O.
C. J. Deckman	Cleveland, O.
Andrew Duty	Cleveland, O.
Wm. H. Hunt	Cleveland, O.
Atlas Car Mfg .Co	Cleveland, O.
Lloyd Brown	Cleveland, O.
Geo. O. Berry	Columbus, Ga.
J. W. Candler	Collinwood, O.
Prof. Edward Orton	Columbus, O.
The Ironsides Co	Columbus, O.
The Jeffrey Mnfg. Co	Columbus, O.
L. G. Kilbourne	Columbus, O.
A. V. Bleininger	Columbus, O.
W. D. Richardson	Columbus, O.
Adam Schneider	Columbus, O.
D. C. Meehan	Columbus, O.
Capital City Brick Co	Columbus, O.
M. P. Street	Columbus, O.
Albert Carter	Columbus, O.
C. H. Doan	Columbus, O.
The Harper-Norton Shale Brick Co.	Conneaut, O.
The Keller Brick Co	Cuyahoga Falls, O.
Geo. J. Fickes	Carnegie, Pa.
O. B. Reed	Clearfield, Pa.
Clearfield Clayworking Co	Clearfield, Pa.
G. A. Guignard	Columbia, S. C.
J. E. Whiteselle	Corsicana, Tex.
Edward Burns Neal	Charlestown, W. Va.
Frank W. Butterworth	Danville, Ill.
F. L. Selley	Danville, Ill.
Leader Manufacturing Co	Decatur, Ill.
D. C. Haeger	Dundee, Ill.
Geo. M. Krick	Decatur, Ind.
Eagle Iron Works	Des Moines, Ia.
C. A. Rawson	Des Moines, Ia.
Flint Brick & Coal Co	Des Moines, Ia.
E. R. Dillehay	Danville, Ky.
A. Wagner & Son	Dearborn, Mich.
J. C. McDonald & Son	Detroit, Mich.
Frank M. Willeson	Detroit, Mich.
John S. Haggerty	Detroit, Mich.
F. H. Wolf Brick Co	Detroit, Mich.
American Blower Co	Detroit, Mich.
Geo. H. Clippert & Bro	Detroit, Mich.
Walter J. Hayes	Detroit, Mich.
H. C. Weideman (Huettman & Cramer Co.)	Detroit, Mich.
Jacob Daniel & Bros.' Brick Co.,	Detroit, Mich.
Thomas Bros. Co	Detroit, Mich.
Walter E. Hilton	Dunkirk, N. Y.
Teigler Bros.	Dayton, O.
The C. W. Raymond Co	Dayton, O.
H. Wirsching	Dayton, O.
Jno. B. Millar	Doncaster, Ont.
E. G. Durant	Elsinore, Cal.
Ben H. Richards	Edwardsville, Ill.
John C. Boss	Elkhart, Ind.
H. C. Kleymeyer (First Ave. Brick and Tile Co.)	Evansville, Ind.
F. G. Thompson	Elizabeth City, N. C.
R. R. Morris	Epping, N. H.
George S. Cox	East Liverpool, O.
L. R. Berkey	Eldorado, Pa.
H. C. Dunn	Erie, Pa.
W. O. Kutsche	Erie, Pa.
W. G. Kramer	Frankfort, Ind.
Wallace Mfg. Co	Frankfort, Ind.
E. A. Poe	Fayetteville, N. C.
D. Carl Child	Findlay, O.
D. M. Potter	Fremont, O.
U. J. Matson	Falls Creek, Pa.
George F. Speer	Fort Worth, Tex.
Francis Alba de Costa	Fredericksburg, Va.
Gadsden Brick Co	Gadsden, Ala.
W. S. Purington	Galesburg, Ill.
A. Thomas	Greenville, Ill.
F. E. Frey	Glenville, O.
George N. Dyer	Gardner, Mass.
C. C. Dyer	Greenfield, Mass.
W. J. King	Grand Blanc, Mich.
Dinnie Bros	Grand Forks, N. D.
William P. Aslip	Grand Forks, N. D.
W. G. Dove	Geneva, N. Y.
D. P. DeLong	Glens Falls, N. Y.
Frank E. Wiles	Grassy Point, N. Y.
Owen Monahan	Green Ridge, S. I., N. Y.
E. M. Freese & Co	Galion, O.
B. F. Place	Galion, O.
A. R. Harwood	Gonzales, Tex.
William Finnegan	Green Bay, Wis.
G. H. Todd	Hartford, Conn.
Jno. W. Rust	Hartford City, Ind.
Kleymeyer & Klutey Brick & Tile Co.	Henderson, Ky.
Geo. D. Dalton	Hopkinsville, Ky.
P. J. Connell	Holton, Mich.
Charles H. Bray	Helena, Mont.
R. G. Eisenhart	Horseheads, N. Y.
Philip Goldrick	Haverstraw, N. Y.
C. H. Forry	Hanover, O.
J. W. Jones	Haydenville, O.
W. A. Stephens	Hammond, W. Va.
Henry W. Carter	Highcliff, Wis.
Marion Brick Works	Indianapolis, Ind.
Indianapolis Terra Cotta Co	Indianapolis, Ind.
T. A. Randall & Co	Indianapolis, Ind.
C. & A. Potts & Co	Indianapolis, Ind.

Jas. Hensley ....Indianapolis, Ind.
John McKay (National Dry Kiln Co.) .. ..Indianapolis, Ind.
Robert Elliott ....Indianapolis, Ind.
L. P. Battefeld..........Indianapolis, Ind.
Ed. Gerard (National Dry Kiln Co.).... ....Indianapolis, Ind.
W. W. Winslow..........Indianapolis, Ind.
Adams Brick Co..........Indianapolis, Ind.
Heinrich Ries ....Ithaca, N. Y.
M. J. Stone....................Ithaca, N. Y.
Wm. Moore Angas ....Jacksonville, Fla.
George R. Foster.........Jacksonville, Fla.
J. F. Lewis....................Jackson, Mich.
George H. Morton ....Jewettville, N. Y.
Jefferson Brick & Tile Co....Jefferson, Wis.
Wm. Paul Gates..............Kipling, Ala.
Horace D. Payne.......Kensington, Conn.
J. M. Leach....................Kokomo, Ind.
H. H. Leach....................Kokomo, Ind.
Wm. F. Scott ....Keokuk, Ia.
Walter S. Dickey.........Kansas City, Mo.
Shinnick & Massman ......Kansas City, Mo.
Robert Nesch.............Kansas City, Mo.
George Frank Ball ....Keene, N. H.
Albert Terry ....Kingston, N. Y.
J. Terry...................Kingston, N. Y.
G. W. McNees.............Kittanning, Pa.
J. F. Scott ....Knoxville, Tenn.
Knoxville Brick Co.........Knoxville, Tenn.
T. C. Lundy...............Knoxville, Tenn.
James McNeen..............LaJunta, Colo.
LaSalle Pressed Brick Co.......LaSalle, Ill.
William Hammerschmidt .....Lombard, Ill.
Harry C. Cramer...........Lexington, Ky.
T. Bishop ....Louisville, Ky.
S. V. Peppel..............Louisville, Ky.
Francis Publishing Co......Louisville, Ky.
Wm. E. Tallman ..Lac du Bonnet, Manitoba.
William Mahanna ....Lenox, Mass.
A. Magoon ....Logan, O.
R. D. McManigal..............Logan, O.
Thew Automatic Shovel Co.......Lorain, O.
Wm. R. Martin............Lancaster, Pa.
I. H. Adams...............Lynchburg, Va.
Nat'l Paint & Manganese Co., Lynchburg, Va.
J. S. McCannell........Milton, Ontario, Can.
George A. Norton.....Mira Ferry, C. B. Can.
Wm. Bailie................Montreal, Can.
James W. Tester...........Montreal, Can.
David A. Stack..........Middletown, Conn.
John D. Johnson ....Middletown, Conn.
E. W. Schreiner...........McAlester, I. T.
Geo. H. Drew..................Macon, Ga.
I. W. McMillan..........Milledgeville, Ga.
Tiffany Enameled Brick Co., Momence, Ill.
B. W. Bennett..................Muncie, Ind.
John D. Mock..................Muncie, Ind.
O. T. Denison..............Mason City, Ia.
L. C. Moore...................Memphis, Mo.
J. J. Hoffman.....................Milan, Mo.
C. A. Bloomfield..........Metuchen, N. J.
Charles W. Keefer.....Mechanicsville, N. Y.
Marion Steam Shovel Co........Marion, O.
C. H. Carpenter ....Martins Ferry, O.
George S. Markley.........Mineral City, O.
Robert H. Evans.................Massillon, O.
John P. McIntyre ....McKeesport, Pa.
Horace E. Fredericks.........Mill Hall, Pa.
Robert A. Speed...........Memphis, Tenn.
Frank H. Reid..............Memphis, Tenn.
L. H. Taylor...............Milwaukee, Wis.
Clifford Chase ....Milwaukee, Wis.
P. L. Youngren...........Milwaukee, Wis.
George J. Schwarz........Milwaukee, Wis.
Fred C. Bogk.............Milwaukee, Wis.
Ferdinand Vogt...........Milwaukee, Wis.
S. J. Kane..................Milton, W. Va.
Phil. J. Hodgman......Moundsville, W. Va.
Virgil M. Palmer.......New Britain, Conn.
E. S. Morse............New Britain, Conn.
R. Clifford Merwin......New Britain, Conn.
F. H. Holmes...........New Britain, Conn.
Wm. Spittler ....New Haven, Conn.
Elford P. Trowbridge....New Haven, Conn.
H. E. Doty.............New Haven, Conn.
J. Wheaton Stone.......New Haven, Conn.
Eastern Machinery Co...New Haven, Conn.
W. A. Davis............New Haven, Conn.
Frank L. Stiles........North Haven, Conn.
The I. L. Stiles & Son Brick Co........ ....North Haven, Conn.
The Stiles & Hart Brick Co............ ....North Haven, Conn.
F. H. Brockett......North Haven, Conn.
Jacob Keller............North Judson, Ind.
W. A. Bailey..........Northampton, Mass.
Cullen W. Parmelee....New Brunswick, N. J.
William S. Myers....New Brunswick, N. J.
A. S. Reed.....................Newark, N. J.
Wm. Lahey...................Newburg, N. Y.
William C. Black.........New York, N. Y.
Andrew A. Ayres..........New York, N. Y.
Robert C. Martin.........New York, N. Y.
E. P. Raymond............New York, N. Y.
G. L. Twitchell..........New York, N. Y.
Orin D. Person...........New York, N. Y.
Pfotenhauer & Nesbit.....New York, N. Y.
Robert Main ....New York, N. Y.
Carl E. Trommer......New York, N. Y.
Ohio Mining & Mfg. Co ...New York, N. Y.
E. E. Gorton.............New York, N. Y.
J. Francis Booream.......New York, N. Y.
Charles T. Harris........New York, N. Y.
H. D. Lounsbury..........New York, N. Y.
Ed. H. Callaway..........New York, N. Y.
M. Gabriel...............New York, N. Y.
A. Koppel................New York, N. Y.
Jas. G. Beemer......New York City, N. Y.
Schwarz System Brick Co.............. ....New York City, N. Y.
H. Huennekes & Co..New York City, N. Y.
Wm. R. Clarke......New York City, N. Y.
D. W. Cummins......New York City, N. Y..
Edward G. Acheson.....Niagara Falls, N. Y.
F. R. Hyman.............New Berne, N. C.
Ellis Lovejoy..........New Lexington, O.
J. B. Wickoff..........New Lexington, O.
O. K. Edwards.............Newberg, Ore.
P. A. Smith............New Brighton, Pa.
Marquis Limestone and Clay Co........ ....New Castle, Pa.
T. L. Herbert...............Nashville, Tenn.
Joe P. Fulcher.............Nashville, Tenn.
W. D. LeSueur..............Nashville, Tenn.
George A. Stephens ....Norfolk, Va.
J. W. Davis............Newport News, Va.
Wm. Francis Keates........Owensboro, Ky.
H. N. Brooks...............Orrington, Me.
C. H. Leathe...........Otter River, Mass.
J. Fred Smith..................Omaha, Neb.
Cyrus Chambers, Jr.........Overbrook, Pa.
A. Brewster................Pine Bluff, Ark.
J. S. McLennan....Petersfield, Sydney, Can.
F. R. Carter......................Peoria, Ill.
A. W. Walton ....Princeton, Ill.
Otto Hensel......................Peru, Ind.
Thomas H. Gwynne.......Pittsburg, Kan.
A. R. Batley...............Pittsburg, Kan.
H. W. Katterjohn............Paducah, Ky.
S. A. Williams............Ponchatoula, La.
F. R. Redlon..................Portland, Me.
S. B. Densmore..............Portland, Me.
William Lucas..............Portland, Me.
Melvin Hamblet ....Portland, Me.
A. R. Root..................Princeton, N. J.
The Horton Mfg. Co.........Painesville, O.
C. H. Horton...............Painesville, O.
John Peebles ....Portsmouth, O.
The Peebles Paving Brick Co. Portsmouth, O.
H. S. Grimes...............Portsmouth, O.
J. D. Fate & Co.............Plymouth, O.
Andrew M. Smith............Portland, Ore.
A. C. Giveler.......Pine Grove Furnace, Pa.
Murrell Dobbins..........Philadelphia, Pa.
Atlantic Brick Mfg. Co.....Philadelphia, Pa.
Webster & Keyser.........Philadelphia, Pa.
J. H. Chambers...........Philadelphia, Pa.
Wm. Conway ....Philadelphia, Pa.
T. B. McAvoy.............Philadelphia, Pa.
Main Belting Co..........Philadelphia, Pa.
Geo. W. Sharer...........Philadelphia, Pa.
D. Chas. Murtha..........Philadelphia, Pa.
Jno. H. Earley...........Philadelphia, Pa.
O. W. Ketcham............Philadelphia, Pa.
Smith Bros. Brick Co.........Pittsburg, Pa.
L. D. Strauss................Pittsburg, Pa.
C. A. Rifle..................Pittsburg, Pa.
D. T. Riflle.................Pittsburg, Pa.
H. L. Irwin..................Pittsburg, Pa.
Sankey Bros. ....Pittsburg, Pa.
Phillips & McLaren...........Pittsburg, Pa.
W. D. Henry..................Pittsburg, Pa.
W. R. Hersperger.............Pittsburg, Pa.
William Flinn ....Pittsburg, Pa
Grant Dibert ....Pittsburg, Pa.
Darlington Brick & Mining Co., Pittsburg, Pa.
S. C. Martin.................Pittsburg, Pa.
D. J. Kennedy................Pittsburg, Pa.
Xavier Wittmer ....Pittsburg, Pa.
C. F. Monfort ....Pittsburg, Pa.
W. W. Whiting................Pittsburg, Pa.
Evan Jones ....Pittsburg, Pa.
A. A. Hersperger.............Pittsburg, Pa.
Central Brick Co.............Pittsburg, Pa.
Thos. M. Wilson..............Pittsburg, Pa.
Henry R. Griffin...........Phoenixville, Pa.
S. Hicks...................Providence, Ky.
W. G. Titcomb..............Providence, R. I.
New England Steam Brick Co.,.......... ....Providence, R. I.

Samuel Gunther ......Pt. Washington, Wis.
Madden & Co..................Rushville, Ind.
A. S. Currie....................Reddick, Ill.
Robert Goodwin, Jr............Redfield, Ia.
Caleb C. Marshall............Rosedale, Md.
William E. Turner.........Rochester, N. H.
D. H. Applegate............Red Bank, N. J.
W. H. H Regers.........Rochester, N. Y.
N. Y. Hydraulic Press Brick Co......... ....Rochester, N. Y.
W. W. Parry......................Rome, N. Y.
John B. Rose..................Roseton, N. Y.
W. S. Ravenscroft............Ridgway, Pa.
W. L. Miller..................Rochester, Pa.
A. W. Perkins...................Rutland, Vt.
F. McG. McBean.......SanFrancisco, Cal.
W. C. Trotter.......St. Johns, P. Q., Can.
C C. Barr........................Streator, Ill.
Fawcett Plumb ....Streator, Ill.
W. B. Lower..................Sioux City, Ia.
C. J. Holman.............Sergeant Bluff, Ia.
Elias Petts..................Shreveport, La.
F. Salmen ....Slidell, La.
T. H. Mitchell ....Salisbury, Md.
W. A. Sanborn............Somerville, Mass.
Russell A. Bailey........Springfield, Mass.
T. D. Potter.............Springfield, Mass.
E. L. Cook.............State Farm, Mass.
James A. Gray.......................Saco, Me.
John H. Qualman..........Saginaw, Mich.
Charles H. Kepler.........Saginaw, Mich.
Mershon, Schuette, Parker & Co......... ....Saginaw, Mich.
Jno. L. Jackson............Saginaw, Mich.
D. M. Warner....................Sparta, Mich.
A. C. Ochs...............Springfield, Minn.
Geo. H. Schellenberger.......St. Paul, Minn.
F. D. Kendrick.............St. Paul, Minn.
Christy Fire Clay Co.........St. Louis, Mo.
J. W. Barney.................St. Louis, Mo.
W. C. Mitchell...............St. Louis, Mo.
Robert Twells ....St. Louis, Mo.
Anthony Ittner ....St. Louis, Mo.
H. A. Wheeler................St. Louis, Mo.
M. F. Williams...............St. Louis, Mo.
J. M. Williams...............St. Louis, Mo.
Lemon Parker.................St. Louis, Mo.
W. P. Grath..................St. Louis, Mo.
Fernholtz Brick Machine Co..St. Louis, Mo.
Jno. P. Camp.................St. Louis, Mo.
R. F. Grady..................St. Louis, Mo.
Geo. J. M. Ashby.............St. Louis, Mo.
Hydraulic Press Brick Co....St. Louis, Mo.
McNeil Pressed Brick Co.....St. Louis, Mo.
Laclede Fire Brick Mfg. Co..St. Louis, Mo.
St. Louis Clay Burning Co....St. Louis, Mo.
J. C. Steele & Son........Statesville, N. C.
A. G. Haven..............Sangerfield, N. Y.
Albert H. Perrigo........Sandy Hill, N. Y.
Thomas Kieran...........Stapleton, N. Y.
J. Frank Plumb...........Syracuse, N. Y.
James L. Breed...........Syracuse, N. Y.
William Cannon, Jr.........Syracuse, N. Y.
A. J. Darbyshire..................Sabina, O.
C. W. Turner................Sciotoville, O.
S. M. Gould.....................Shawnee, O.
Adam Grube & Son..........Springfield, O.
Thos. Kemp ....Strasburg, O.
M. H. Dale..................Scranton, Pa.
Union Brick Co.............Shamokin, Pa.
Alfred Yates ....Shawmut, Pa.
D. G. Loomis & Sons....Sherbrooke, Quebec.
J. P. Cahoon.........Salt Lake City, Utah.
Wm. S. Simpkins.....Salt Lake City, Utah.
H. L. Jacobs.....................Suffolk, Va.
A. V. Sturgeon..................Suffolk, Va.
Joseph Russell..............Toronto, Can.
Geo. H. Campbell...........Toronto, Can.
Will P. Blair..............Terre Haute, Ind.
C. W. Hoff.................Terre Haute, Ind.
J. A. Dailey...............Terre Haute, Ind.
Willis Edson....................Topeka, Kan.
B. C. Pierce..................Taunton, Mass.
James H. Thomas.....Turner's Falls, Mass.
H. Brewer & Co............Tecumseh, Mich.
William Sutton ....Table Rock, Neb.
National Roofing Co.....Tonawanda, N. Y.
James E. Fox.......................Toledo, O.
James Fox...........................Toledo, O.
W. A. Howell.......................Toledo, O.
H. C. Ellis..........................Toledo, O.
A. A. Reilly.........................Toledo, O.
John Doyle.....................Utica, N. Y.
Ben S. Fisher..............Union Furnace, O.
E. G. Blaser..............Upper Sandusky, O.
R. D. Culver..............Veedersburg, Ind.
Wm. H. Neff...............Veedersburg, Ind.
W. P. Whitney.............Veedersburg, Ind.
A. B. Clarke................Vincennes, Ind.
J. M. Jenkins...............Wetumpka, Ala.
Kendall & Flick.........Washington, D. C.
Jno. Miller..............Washington, D. C.
C. B. Pearson............Washington, D. C.
Jefferson Middleton......Washington, D. C.
Hugh J. Phillips.........Washington, D. C.
West Bros.' Brick Co....Washington, D. C.
New Washington Brick Co., Washington, D. C.
United States Sanitary Co., Washington, D. C.
Potomac Brick Co.......Washington, D. C.
Delaware Terra Cotta Co., Wilmington, Del.
Isaac Hardy ....Worksop, England.
Abner L. Hawkes..........Westbrook, Me.
Edward C. Bryan.........Westfield, Mass.
James B. Crowell............Walkill, N. Y.
F. S. Naugle.................Warners, N. Y.
F. W. Bennett...............Wellington, O.
C. McDermott...............Wellington, O.
R. C. Bennett...............Wellington, O.
H. S. Bennett...............Wellington, O.
Stevenson & Co..............Wellsville, O.
W. E. Ellenberger.. West Park P. O. Ohio.
The Cleveland Car Co., West Park P. O., O.
P. L. Simpson..............Willoughby, O.
L. W. Penfield.............Willoughby, O.
Andrew Branstetter............Wooster, O.
B. E. Bechtel..............Waterloo, Ont.
J. E. Mccusker..................Warren, Pa.
C. H. Kimball.......West Philadelphia, Pa.
Henry Hasbrouck........West Winfield, Pa.
George B. Waite..........Wilkesbarre, Pa.
George T. Dickover ....Wilkesbarre, Pa.
D. P. Guise.............Williamsport, Pa.
J. G. Jones...............York Village, Me.
Charles M. Crook.........Youngstown, O.
Zeeland Brick Co...........Zeeland, Mich.
O. N. Townsend.............Zanesville, O.
American Encaustic Tiling Co..Zanesville, O.
R. H. Rutherford...........Zanesville, O.
R. L. Queisser.............Zanesville, O.
Harris Brick Co............Zanesville, O.

In Memoriam.

L. J. Howard, St. Louis, Mo.
C. A. Schultz, Rondout, N. Y.
J. A. Francis, Shamokin, Pa.
G. T. Howe, Leeds Junction, Maine.
Henry Maurer, Brooklyn, N. Y.
L. D. Haggerty, Detroit, Mich.
J. C. Adams, Indianapolis, Ind.

THE SIXTH ANNUAL MEETING OF THE AMERICAN CERAMIC SOCIETY.

SOCIETY met at 10:25 A. M., February 1st, in the Convention Hall of the Grand Hotel. In the absence of the President, Mr. E. C. Stover, and the Vice-President, Dr. Heinrich Ries, both on account of illness, Mr. W. D. Gates was made chairman pro tem. He read a short retiring address from the President, expressing his severe disappointment at being unable to join in the work of the Society at this meeting.

The results of the election of officers was as follows: President, F. W. Walker, Beaver Falls, Pa., of the Beaver Falls Art Tile Co.; Vice-President, Albert V. Bleininger, B. Sc., Columbus, O., Instructor in Ceramics, Ohio State University; Secretary, Edward Orton, Jr., E. M., Columbus, O.; Treasurer, Stanley G. Burt, Cincinnati, O., Rookwood Pottery Co.; Managers: Adolph F. Hottinger, Chicago, Ill., Northwestern Terra Cotta Co.; E. E. Gorton, New York, N. Y., Manager W. A. Underhill Brick Co.; E. C. Stover, Trenton, N. J., Trenton Potteries Co.

Mr. Walker, on occupying the chair, gave a thoughtful address, to which the Society listened with great profit.

The report of the Treasurer showed that the receipts of the Society for the year had been:

Balance brought forward from last year......	$162.83
From dues of members and associates.......	762.53
From sale of transactions.................	310.08
Profits from sale of Seger's collected writings.	189.55
	$1,424.99
Expenditures	1,219.64
Balance	205.35

These figures were received with great satisfaction, from the fact that Volume V was a much larger and more expensive volume than any preceding one, and it was feared that the Society's resources would hardly stand the strain of its publication. They would not have done so except for the handsome and rapidly increasing sale of the transactions and other printed matter.

The following list of new associate members was elected: Saburo Kawara, 64 Higashikata Machi, Nagoya, Japan, Ceramic Chemist, Moriumra Bros.; William P. Clarke, New York City, N. Y., President Celadon Roofing Tile Co.; Charles V. Thrall, Tottenville, Staten Island, N. Y., Superintendent Atlantic Terra Cotta Co.; Mark Ogan, Corning, N. Y., Chemist, M. E. Gregory Terra Cotta Co.; Charles Wm. Thomas, Stourbridge, England, Managing Director, E. J. & J. Pearson; Harry A. Rum Bellow, Leeds, England, Chief Research Chemist and Technical Advisor, Leeds Fire Clay Co.; Ellsworth Ogden, Columbus, Ohio, Ceramic Student, Ohio State University; Rafael Guastovino, Jr., New York City, N. Y., Superintendent, R. Guastovino Co.; Wolsey G. Worcester, Parkersburg, W. Va., Superintendent, United States Roofing Tile Co.; Julius J. Koch, Shawnee, O., Superintendent, Ironclay Brick Co.; Jacob Lindley, Trenton, N. J., Foreman, Ideal Pottery Co.; Logan Waller Page, Washington, D. C., Chief, Road Material Laboratory, U. S. Dept. Agriculture; Allerton S. Cushman, Ph. D., Washington, D. C., Chemist, Road Material Laboratory, U. S. Dept. Agriculture; Edward G. Acheson, Niagara Falls, N. Y., President, The Acheson Co.; Edward W. Robinson, Hartford, Conn., General Manager, Hartford Faience Co.; Edward P. Page, Stourbridge, England, Draftsman, E. J. & J. Pearson Co., Ltd.; Francis C. Preston, Cleveland, O., Sales Agent, Dover Fire Brick Co.; Bennett Eskesen, Matawan, N. J., Superintendent, N. J. Mosaic Tile Co.; Ray T. Stull, E. M., Nunda, Ill., Chemist, American Terra Cotta and Ceramic Co.; William Francis Keates, Owensboro, Ky., Secretary and General Manager, Anglo-American Potteries Co., Pittsburg, Pa.

The following list of changes in grade from associate membership to full membership was adopted at the last session of the meeting. In each case the elevation in grade was in recognition of the active work done for the Society by the person designated and the scientific merit of his contributions; Lawrence E. Barringer, E. M. Schenectady, N. Y., Research Department, General Electric Co.; Walter A. Hull, E. M., Bolivar, Pa., Chemist and Salesman, Reese-Hammond Fire Brick Co; Otto Hensel, Peru, Indiana, Ceramic Experimenter and Chemist; Allerton S. Cushman, Ph. D., Washington, D. C., Chemist, Road Material Laboratory.

These additions and changes in grade, leave the roster of the Society as follows:

	American.	Foreign.
Honorary members......................	1	0
Members, representing ten States........	29	1
Associate members representing 20 States.	108	12
	138	13
Grand total	151	

Among the business transacted, the following items may be mentioned:

The Society will exhibit its work, in the form of printed volumes of the transactions, in a neat little case, in the clay industry exhibit at the St. Louis Exposition.

Members and associates will hereafter be allowed to purchase only one full set of the transactions at the reduced rate.

Schedule of advanced prices was adopted for the transactions, to take effect whenever the number of any volume remaining falls below 200 copies. The rates will progressively increase as the copies become fewer. Some of the volumes are now close to the 200 limit, and will soon begin to be marked up in price.

The Secretary was instructed to insure the stock of publications now remaining on hand at full value.

The Secretary was instructed to correspond with the English Ceramic Society and the Deutchen Vereinfur Thon, Cement and Kalk Industrie, to see whether a joint meeting of the three organizations could be arranged at St. Louis in the coming summer.

PRES. F. W. WALKER, Beaver Falls, Pa.

The literary programme was not quite so crowded as at Boston, but there were more papers than could be read, even by bringing in one extra session, so that four had to be read by title at the close of last session. A number of written discussions were also passed by and will appear in the transactions, Volume VI.

Mr. L. E. Barringer, in his paper on "The influence of Magnesia on Clay," took the ground that in white-burning bodies of the porcelain type, the magnesia did not respond to the statements of Maeckler and Hottinger, but was conspicuously inferior to lime as a body flux. In the discussion, the influence of the iron in yellow and red burning bodies was thought to be partly responsible for the activity of magnesia, by acting as a catalytic agent.

Mr. Samuel Geijsbeek, in his paper on "Seger Cones and Their Fusing Point, Expressed in Degrees," took the ground that the formal list of melting points now issued by the manufacturers of cones, should be greatly amended to conform to the facts. He showed that compared to the Chatelier pyrometer, the cones fused at higher temperatures in a 24-hour burn than in a 96-hour burn, and that this difference, while regular, was considerable. In the discussion, the inability to accurately express cone-melting points or degrees was generally admitted, and the futility of using degrees in this connection was emphasized. But the fact that the melting points corresponded to *heat work*, not temperature, was emphasized and the value of this kind of a heat unit was amply established.

Mr. Stanley G. Burt, in a very neat little paper on "Faience vs. Majolica," defined the former as ware made of a colored body with a transparent glaze, clear or colored, while he defined majolica as a colored body with an opaque glaze or enamel.

Dr. Heinrich Ries, in his "Note on the Tensile Strength of Clays," suggested that tensile strength is a factor dependent on there being a proper gradation of sizes of grains in the non-plastic constituents of a clay, by which the interstitial spaces of the larger grains would be filled with smaller ones and the greatest possible density obtained. The failure to correlate plasticity and tensile strength was noted.

Prof. H. A. Wheeler gave a very interesting and suggestive paper on "Conductivity of Refractory Materials," and showed his experimental data obtained from a study of retorts for zinc distillation. The paper was of great value to refractory material men and also to all who use saggers or muffles in burning their ware.

Dr. Allerton S. Cushman gave a paper on the "Colloid Theory of Plasticity," which was distinctly the event of the meeting. Dr. Cushman attacked the problem from the standpoint of modern physical chemistry, and while not definitely proving his case, showed that no other theory yet advanced explained the observed facts so well and with so few inconsistencies. This paper will stimulate thought and research along this most interesting field for a long time to come. There was a good deal of spirited defense of the old theories made, but the views of Dr. Cushman were too new to be either successfuly attacked or accepted.

Mr. W. A. Hull gave a short note on "Chrome-Tin Pink," defining his former work and showing that some of the facts submitted by his critics were capable of a construction which supported his own views.

Mr. E. G. Acheson, of Niagara Falls, presented a paper which had been printed and circulated in advance of the meeting to members only, on the merits of his patented process of treating clays with tannin and other organic solutions to increase their plasticity and tensile strength and decrease the water-content necessary for plasticity. He illustrated his discussion with some experiments and products which had been so treated. The discussion which followed covered the whole field of the Ries, Cushman and Acheson papers. It was shown that a great number of other materials, organic and inorganic, had the same kind of action on clays, and that the use of such substances was well known and constantly practiced for many years by potters who are working tender bodies. Mr. Acheson stated that his process could be applied at a cost of not to exceed $1.60 per ton, to clays unworkable on account of their tendency to crack, while otherwise of good quality. The criticism was offered that this cost, or even a very much reduced cost, would be prohibitive to all the crude clay industries in which red or yellow burning clays are employed; also, that organic substances, if used in any extent, are very bad ingredients to introduce into such clays on account of their reducing influence on the iron and liability to the production of discolorations. The paper aroused a good deal of interest.

Mr. Albert V. Bleininger gave a most excellent paper on some experimental work on Portland cements and showed that cements of the natural rock, "Louisville" type, could be greatly strengthened and greatly improved in constancy of volume by simple regrinding with a small amount of free calcium oxide. The simplicity and cheapness of this treatment should make this discovery of great industrial importance to the cement makers.

Mr. Ray T. Stull, of the American Terra Cotta and Ceramic Co., gave a talk on "Crystallized Glazes," illustrated by samples of his own manufacture, of very great interest. The crystals shown were some of them one and one-half inches in diameter and of a beautiful silky nature. Mr. Stull generously gave the whole story of their discovery and development, including the formulae of the glazes complete. The crystals are of the titanium-zinc variety.

Other papers were read which cannot be described at this time, and others were read by title. Among the latter was Prof. John C. Branner's "Bibliography of Clays," which he proposes to donate to the Society to be printed as a separate book. This book was first published by the United States Geological Survey, and is the best thing of the kind in existence. It originally contained the titles of about 2,900 books on clays in all languages. Prof. Branner now has brought up the list of titles to 4,500, and is still adding to them, so that it will now be authoritative. The Society decided, in publishing this volume, to keep it separate from the transactions, and place it on sale at a price which would bring it within the reach of all. Next to the Seger translation, this work will be the most important thing yet undertaken by the Society.

The Society visited the Rookwood Pottery on Tuesday morning, and the Cambridge Art Tile Co on Wednesday afternoon. Tuesday evening was occupied by a lecture from Prof. Wheeler, on the approaching World's Fair at St. Louis, illustrated by 60, or more, fine lantern slides.

The meeting, on the whole, was the best yet held. The papers were unusually meaty; the discussions better prepared and more to the point; and the spontaneous additions to the programme were most valuable. The spirit of the organization seems to increase constantly. The roster was also greater than ever before, there being over 50 members and others present who attended for this purpose, not counting members of the N. B. M. A., who casually visited the Society at one or more sessions.

CONVENTION ECHOES.

How it Feels to Miss a Convention.

Dear Randall—You do not know how deeply I regret the fact that I could not get to the Convention at Cincinnati. You cannot know because you have never known what it is to miss one.

From all accounts which have come to me, you had a grand Convention, and you and the local members are to be congratulated.

The last CLAY-WORKER was my only consolation, and while not the Convention, it was a grand substitute. With it and the next number in which there will be many familiar faces, I shall feel that I have had a pretty good Convention after all. E. Lovejoy.

New Lexington, O., February 6.

No Real Danger.

My Dear Randall—It hardly seems possible that it was a week ago today that I said good-bye to so many of my dearest friends at the Grand Hotel in Cincinnati. This is not Alabama, and lacks somewhat the poetic inspiration which the whiskered pines, the razor-backed hogs and sweet-voiced dusky maidens of that State always furnish gratis to W. D. G., but there is nothing in Alabama can equal what we have had since our arrival here in the matter of fogs and rain, cold east and cold west winds, mixed in sort of promiscuously with beautiful sunshine and delicious moonlight.

But that's another story. This one is of the Convention. Larger in numbers, more interesting as a technical study; it seems to me that more than ever we have reasons to be thankful for these yearly gatherings. I am unable to see that there is a falling off in any direction.

For further elucidation of my views, see last year's report of the Boston banquet, this year's first Convention paper and eighteen letters written each year just after the Convention. When you have done this you will, I am sure, agree with a large number of the members of the Cincinnati meeting that unless the brakes are put on there is great danger of too much. PURINGTON.

Ocean Springs Hotel, Ocean Springs, Miss., Feb. 10, 1904.

First Impressions.

My Dear Mr. Randall—Once more Mrs. Acheson and I find ourselves amidst the snows of the north after five days passed with great pleasure in Cincinnati at the Annual Conventions of the American Ceramic Society and the National Brick Manufacturers' Association.

My original purpose was attendance on the Convention of the American Ceramic Society. I having but recently become a member of that organization, this was my first acquaintance with its members and meetings. I was much pleased with both and gratified to see the happy co-operation of the members, and early realized the extent of the field of investigation before the Society and the earnest work it was doing.

The Convention of the National Brick Manufacturers' Association following immediately upon that of the American Ceramic Society, overlapping it as it were, I had the opportunity to form the acquaintance of a number of its members and see the order of its business. As a stranger I was impressed with the extent and value of the work the Association was doing, and the unique and pleasant manner its labors were intermingled with social enjoyment and good fellowship.

Congratulations to the officers are in order for the results attained. I was so pleased and appreciative of the possible advantages of affiliation with the Association I forthwith made application for membership, and being furnished with a number and badge I thereafter passed in the multitude as a maker of bricks.

On the whole I found so much pleasure in my trip and new acquaintances that I shall look forward to the next Convention with increased impatience. EDWARD G. ACHESON.

Niagara Falls, Feb. 8, 1904.

Reflections and Memories of the Cincinnati Convention.

Friend Randall—Back again among moving machinery and burning kilns, the writer feels prompted to congratulate the members of the N. B. M. A. upon the very successful convention just held in Cincinnati. In rambling through the corridor of the Grand Hotel, the following remarks were heard: "I just had a good time; met friends I had not seen for years." "Well, sir, I did very well; just closed a good contract for a machinery outfit." Another was heard to say: "I believe I have my manufacturing troubles solved from information received from brother so-and so."

So taking all the various remarks heard into consideration, it is, beyond doubt, an established fact that the convention was an unquestionable success.

In rambling through the city, the writer took particular notice of the various large buildings erected and in the process of construction and was more than pleased to see that there was quite a number of varieties of building brick used, which is certainly a good barometer of the progressive spirit of the city, in that all the manufacturers of the different styles of brick had a 'whack" at the jobs.

There have certainly been offered opportunities to the brickmakers to have their materials tested in all these various structures.

The writer had not been in Cincinnati for a number of years and was more than ordinarily surprised at the remarkable enterprise, progress and growth of the city, which stamps it as exceedingly prosperous and believes that the future will be exceedingly bright in both the manufacturing and commercial lines.

The good time had at the Convention at Cincinnati is a guarantee of the attendance at the next convention.

Yours truly, JULIUS J. KOCH.

Impressions of His First N. B. M. A. Convention.

Dear Mr. Randall—Now that I have got back to my home in the sunny South and the ideas gathered at the recent Cincinnati Convention have had time to soak into my mind, and have, I trust, so soaked, it may not be altogether out of place for me to write and give you the impression left on my mind by my first convention.

Perhaps the strongest impression I brought away was that of the great benefit derivable from chats in the lobbies. Do not understand me to depreciate the value of the papers read and the discussions thereon; rather take it that I desire to emphasize the value of the less prominent feature of the Association, of the informal chats with other men who either now have or in the past have had their difficulties to contend with and overcome. Certainly you might take as the Convention motto: "Iron sharpeneth iron, so a man sharpeneth the countenance of his friend."

You must please arrange to have the next convention in some place reasonably accessible to us Southern men; for it is my present intention to attend, if possible, and I do dislike long railroad journeys.

With kind regards, I remain,

Yours sincerely,

Jacksonville, Fla. WM. MOORE ANGAS.

Written for THE CLAY-WORKER.

POTTERY NEWS.

THE RECENT HIGH WATER in the Ohio River caused a great deal of loss in East Liverpool, Ohio, and vicinity, especially among the potteries. The water in the river rose so high that the pumping stations were forced to close down thus making a water famine imminent.

The Globe Plant of the East Liverpool Potteries Co. suffered from the effects of the flood slightly. The Colonial Pottery suffered to a somewhat greater extent, while the Harker Pottery Co., the National China Co. and the C. C. Thompson Pottery Co., all being on lower ground, were forced to shut down their plants entirely and vacate the large portion of the works, removing the stock to the upper floors to keep it from becoming water soaked and becoming otherwise damaged by ice and dirt. The plants have all recovered, however, and after a good cleaning up are ready for business again. All are now running full blast and a good season is expected.

So far the pottery trade has not been up to the usual standard but the potters are very well satistied as the prospects for a good year's run are very favorable.

The Knowles, Taylor & Knowles Co., East Liverpool, are now operating a new decorating kiln, recently erected. The Sevres China Co. will also erect a new set of decorating kilns.

The new plant of the O'Connor Sagger Co. is progressing favorably, and will be ready for the installation of the machinery within the next thirty days.

Extensive improvements are being made at the plant of the Electric Porcelain Co., of this city. Additional kilns will probably be erected and contracts have already been let for the erection of two additional brick buildings. The company have also let contracts for additional machinery and will almost double their present output.

The J. B. Owens Pottery Co., of Zanesville, has elected J. B. Owens President, Treasurer and General Manager; F. G. Dodd, Vice-President; A. W. Burg, Secretary, and G. L. Brush, Superintendent Sales and Assistant Manager.

The plant of the Bell Pottery Co., of Columbus, Ohio, which Is now being completed will be ready for occupancy within the next sixty days. The plant is a twelve kiln affair.

The works of the Interstate Clay and Mineral Co., of Blandon, Pa., were destroyed by fire last month, entailing a loss of $8,000, which was partially covered by insurance.

The Columbia Pottery and Manufacturing Co., of Kokomo, Ind., will make improvements to their works in that city.

The Akron Smoking Pipe Co., of Mogadore, Ohio, are installing some new machinery in their electrical porcelain works there.

The Logan Pottery Co., of Logan, Ohio, are adding a new department to their pottery for the manufacture of specialties and expect to have same in complete operation within the next two weeks.

At a meeting of the board of directors of the East Palestine Pottery Co., of East Palestine, Ohio, W. C. Chamberlain was elected President, R. N. Chamberlain Secretary and Treasurer, W. S. George was elected Manager. The company now controls three plants. The East Palestine Pottery Co., and the Continental China Co., both located at East Palestine and the Canonsburg China Co., located at Canonsburg, Pa.

The foundations have been placed for the plant of the Novelty Pottery at Crooksville, Ohio, and the balance of the plant will be completed just as soon as the material can be located on the ground and the weather will permit of building.

The Barberton Pottery Co., of Barberton, Ohio, have elected M. O'Neil, President; G. P. Good, Vice-President, and G. G. Pryor, Secretary.

The Sinclair Art Co. is a new concern in East Liverpool, Ohio, whose plant is now in course of construction at Chester, W. Va., opposite the city. Mr. George Sinclair is at the head of the new plant which will turn out only hand decorated goods.

C. A. Smith, of Chester, W. Va., has made the Union Potteries Co., of Pittsburg, Pa., an offer to locate their plant, which was recently destroyed at New Cumberland, W. Va., in Chester in place of rebuilding at New Cumberland. If the plant is rebuilt at all the company will no doubt consider.

James Carr, a well-known pottery manufacturer, died in New York Monday, February 1st. He was in his 84th year and a native of Hanley, England. He came to America in 1844 and located in Jersey City. In 1855 he went to South Amboy, N. J., and was one of the owners of the Swanhill pottery. In 1853 he established a china plant in New York City and in 1878, with Edward Clarke, began making granite ware at the Lincoln pottery in Trenton. Only recently did he retire from business. He was one of the founders of the International Pottery. TOM POTTER.

East Liverpool, February 9, 1904.

COLORADO CLAY NEWS.

THE VAN BRIGGLE POTTERY COMPANY of Colorado Springs, has increased its capital stock from $50,000 to $75,000 in order to raise additional funds for exhibition purposes at the St. Louis Fair. As works of art this pottery will create even more comment at the fair than it did a year ago when exhibited at the Paris salon. Mr. Van Briggle has been working on his secret for twenty-five years, but the product has been on the market less than two years or since the company was formed which bears his name.

The company has just completed the firing of a kiln of over 700 pieces for the exhibition. There are many striking designs. One in which Mr. Van Briggle takes particular pride is a tiny vase less than three inches in height. Its body is in a deep green and over this is transparently spread a golden yellow giving the appearance of a fluid running over the vase. Another interesting piece of work is a large lamp designed in yellow which shadows unconsciously into a royal purple.

All of the pottery is characterized by a matt, or dull glaze, differing materially from that of other wares. The pottery is also in a great variety of tints and most of the designs are adaptations of Western flowers.

—A New Sand-Lime Brick Plant—

Colorado Springs capitalists have purchased the Colorado rights for the manufacture of brick according to the Huenneckes system and already plans are under way for a plant at Colorado Springs.

A company will be incorporated under the laws of the State to be known as the Colorado Artifical Stone and Brick Co. This company will have a paid up capital of $50,000 and nearly the entire amount will be expended on its first plant which will be erected in Colorado Springs in the early spring. Should this venture prove a success other plants will ultimately be started throughout the State.

The organizers have been fortunate in securing the services of Ben Brewer, an experienced brick manufacturer of the State, who will act as superintendent. The other officers are: Clark Mellen, President; R. J. Verner, Vice-President; G. S. Bierbauer, Secretary, and John Goff, Treasurer. In this connection it should be said that Mr. Goff represents the interests of the Newton Lumber Co., which is one of the largest lumber concerns of the West. M. S. C.

Written for The Clay-Worker.

WITH THE BRICK AND TILE MANUFACTURERS OF NORTHERN OHIO.

THE BRICK SITUATION in Toledo for the past month has been very quiet, there being very little business done in the city or throughout northwestern Ohio. The two plants, the Ohio and the Findlay Hydraulic, which usually run throughout the winter season, are still closed down and will in all probability remain so until the early spring. There is little demand for brick, in view of the severe cold weather. There has not been for several years so little building going on as has been during the winter thus far. Usually work has been carried on throughout the winter season, but not so this winter. The extreme cold of the current season has completely suspended operations during the past four weeks. Just prior to Christmas, frost settled in building stone, thus making it imposible for good work to be done.

A visit to a dozen different architects in Toledo reveals the fact that there is not much doing in building circles. A number of firms have work on hand in the way of plans, but they say the weather is entirely too cold for building and therefore the plans fail to be carried out, for the present.

The indications are very bright for an active resumption in the early spring. There is a great demand for new houses, and moderate-priced dwellings are wanted, consequently it is believed that Toledo will experience a great boom in building during the coming season.

Brick men and architects are of the belief that there will be little trouble from labor organizations during the coming season. The only organization that has recently made a demand for a change in the scale, is the Tinners' Union. The carpenters' strike has been settled on a basis of 37½ cents per hour, and most of the contractors are paying that, although carpenters are working at various prices.

President Stolberg, of the Toledo Board of Public Service, says that the workhouse brick plant, in its product being placed on the market, keeps the price of bricks down. A bill as introduced by Senator Pollock at Columbus, has to do with the brick making of the Toledo workhouse. The bill provides for the appointment of a board by the Governor that shall take charge of the product of all penal institutions of the State, including penitentiaries, reformatories, workhouses, whether State, county or city. The bill infers that the products from these institutions can be used by the State and the commission is to attend to the distribution of the same. It is expected this will stop the making of products to compete with free labor, such as brick from the Toledo workhouse. The one product of the Toledo workhouse which contributes over one-half of the amount necessary to run the institution for one year, is the manufacture of brick. Last year the workhouse realized $12,500 from the sale of brick, made by the prison laborers. These figures represent the sale of nearly two million brick, which sold for the regular market price of $7 per thousand. Aside from the sale of brick the only revenue derived from the workhouse is for prisoners from outside counties, which will not amount to more than $3,000 annually. The average expenses of the Toledo workhouse is estimated to be between $22,000 and $23,000. Adding the two sources of income, which total $16,000, still leaves a deficit of $6,500 to be made by taxation, one-half of which is paid by the county, and one-half by the city. With the Pollock bill in effect, the manufacture of brick, according to a statement from Superintendent Ritter, will be shut off. The facilities of the Toledo workhouse are practically limited to the manufacture of this sole product. While the workhouse authorities are anxious to see the bill defeated, brickmen throughout this section, are anxious to see the bill become a law.

Prospects for paving during the coming season, are certainly very bright. Last season, under the new State code, no new contracts were awarded. Already the board of public service has awarded a number of contracts. Page street, from Vermont to Jerome, will be paved with Nelsonville brick on sand, with Berea curb, at a price of $1,182, the contract being awarded to Bodette & Sheehan. Elm street, between Ontario and Champlain, will be paved by Russell & Jennisen, with Harris pavers on concrete, with Berea curb, costing $5,543. O'Sullivan & Sheehan have been awarded the contract for paving Auburn avenue from Monroe to Baneroft with Nelsonville brick, Berea curb, and broken stone foundation, costing $11,945.

Sewer construction during the coming season promises to be quite extensive also.

The annual meeting of the Ohio Brick Co. was to have been held last month, but has been postponed until a later date on account of severe illness of A. B. Kuhlman, of the concern. Mr. Kuhlman took down January 10 with a severe attack of pneumonia, and was confined to his residence up to last Monday. The annual meeting will probably be held some time during the month.

Your correspondent has communicated with a number of the county seat towns throughout northwestern Ohio, and finds that in every case the building situation has very bright prospects for the coming season. Contractors at Kenton state that there will be more work in their line during the coming season than was done last year. Many houses will be erected and contractors and workingmen will have their hands full during the entire season.

The contractors at Findlay make the same report as those at Kenton.

At Sandusky the building prospects are exceedingly bright, and considerable building will be done this spring. A year ago at this time, the contractors and mechanics were at loggerheads, but now they are working hand in hand and no trouble is expected. There is every indication for a decided improvement over last year's business. Prices of material and labor show no falling off. Many homes will be erected.

At Bucyrus, local lumber dealers say there is to be more building in Bucyrus during the coming season than for many seasons past. Local architects are getting out plans for numerous buildings, for Bucyrus and adjoining points. A number of business blocks will be built, and manufacturies remodeled. It will be a busy year for brick men, carpenters and lumber dealers.

At Wapakoneta the contractors have already enough work to last a year. Among the new structures to be erected will be a new opera house, two business blocks, and six handsome residences.

The prospects for new paving in Ohio towns outside of Toledo, are very bright. Bids for paving a mile of streets at Upper Sandusky, costing in the neighborhood of $60,000, have been awarded. At Ada, a mile and a quarter on Main and Buckeye streets, will be paved, the contract having been let to E. A. Freshwater & Sons, of New Cumberland, W. Va., the paving to cost $48,969. Grand Rapids is to also pave to the amount of $15,000, H. Cresswell, of Findlay, getting the contract. At Findlay, considerable street paving is also to be done.

The Fremont Pressed Brick & Manufacturing Co., recently incorporated with a capital stock of $25,000, has completed its organization with the folowing officers: President, A. F. Price, Vice-President, Lester Wilson; Secretary, George Wehrung; Treasurer, John M. Sherman; General Manager, H. M. Cook. Directors: H. M. Cook, Joseph Waggoner, Lewis Hartman, Frank Andrews, L. S. McGormley, Lester Wilson and A. F. Price. The company will erect a plant at Fremont, Ohio, and expect to be ready to manufacture brick early in the spring.

The Mosaic Tile and Cement Brick Machinery Co., of Detroit, are interested in locating a sand, cement, brick factory at Bowling Green, Ohio.

T. O. D.

DEATH OF E. B. HALL.

Elijah B. Hall, a pioneer brick manufacturer of the Buckeye State, died at his late residence in Toledo, January 15. He was aged 83 years and his death came after an illness covering the past four years.

Major Hall, as he was commonly known, was born in Charleston, Worcester County, Mass., July 6, 1820. He remained upon his father's farm until he was sixteen years of age. Upon completing the common school studies he entered Lester Academy, where he attended two terms. Then he taught school for one year. Then, learning the carpenter's trade, he entered the employ of a firm engaged in taking contracts for building railway bridges. He was with this firm for seven years, when he decided to start in business for himself, and accordingly formed a partnership with Dwight Briggs, the firm name being Briggs & Hall, with headquarters at Rochester, N. Y., until 1853, when he came to Toledo and took the contract for building the bridges on the Wabash railroad from Toledo to the Illinois State line.

In 186[illegible] Major Hall embarked in the manufacture of brick. At that time the only brick plant known in Toledo was owned and operated by Peter Shaw. Major Hall purchased this plant in that year, and devoted about a third of a century to the manufacture of brick in Toledo. He gave the closest attention to business and at the time of his death was well known throughout this section. The annual output of his Hamilton street plant was in the neighborhood of 8,000,000 brick, there being about seventy-five men and boys steadily employed.

Major Hall was a charter member of the National Brick Manufacturers' Association and attended the annual meetings of that association regularly for many years. He was city councilman during the years of 1868 and 1869. He was city street commissioner in 1872 and 1873. He filled the office of city and county treasurer in 1878 and 1879.

Major Hall was actively engaged in business until his retirement in 1901, in his 81st year. His funeral took place on Sunday afternoon, January 17, from the residence.

A Hoosier's First Convention.

My Dear Mr. Secretary—I reached home safely from the Cincinnati Convention and I can assure you it was one of the most pleasant that I have ever attended. I found it exceedingly Instructive as well as enjoyable and I hope to find it convenient to attend many more in the future. I enclose herewith express order for $2.50. Kindly enter my order for ten extra copies of the next issue of Clay-Worker; if this is not sufficient advise me and will remit balance. If I am not mistaken it is to contain the proceedings of that grand convention. With best wishes, I am,

Very truly yours,

North Judson, Indiana, JACOB KELLER.

Written for The Clay-Worker.

BUFFALO BRICK AND BUILDING NEWS.

THE SEVERE winter weather has retarded building operations in this city a good deal. It is hard to lay brick when the thermometer is hovering around the zero mark. Our weather man says 39.2 inches of the beautiful fell during the month of January. In some of our large cities the ordinances will not permit brick to be laid when thermometer registers below 26 degrees. Still some contractors claim they can do good work when it is several degrees colder than that, by using brown sugar in the mortar to keep it from freezing.

Our Buffalo Pottery Company is in full operation and turning out a superior class of goods. They are making a specialty of glaze decorations and are getting them out with pronounced success. Everything is moving along satisfactorily and indications are they will have a steady market for all they are manufacturing.

Another new industry here, is the Buffalo Litholite Company, capital $100,000, incorporated. They will manufacture by a patented process a stone called Litholite. The stone is cast in sand molds, same as iron and brass are cast. It is claimed that the most elaborate effects and intricate designs are produced easily and cheaply, and it can be polished with the same effect as natural stone. To produce the white limestone, the company use fine crushed stone mixed with Portland cement and water—casting it into any desired shape—sharp sand and the other ingredients to which is added iron oxide to produce red or brown sandstone. It is claimed that in many cities large buildings have been built of litholite. In the Perry Payne building, 500 feet long and 180 feet wide, five stories high, in Cleveland, nothing but litholite was used for the stone work. The company will also manufacture stone burial cases.

To be right in line and up-to-date radium or "eternal light," as it is sometimes called by enthusiasts, will soon be produced in this city. The building all ready for work is located out in West Seneca, near the steel plant, where the radium will be produced from uranium deposits, sent here from Colorado and Utah. The first carload is expected here in about thirty days. The radium will be separated from the uranium by a new process, and it is expected one gramme of 100,000 units of activity will be produced every two days. This does not appear to be a very heavy output, but the enormous sum which radium costs makes a small amount very valuable. The Welsh-Loftus Company, Stephen T. Lockwood, treasurer, are the parties interested in the enterprise.

The National Builders' Supply Association held their annual convention at the Iroquois Hotel, February 3d and 4th. There was 143 delegates present. As a means of identification in the programme book the names of the delegates were arranged in numerical order. Each delegate was handed a numbered button to wear to correspond with the number in the book. Several interesting papers on trade topics were read and discussed. One of them on sand-lime bricks. The delegates were well taken care of by the local committee, but the weather man could hardly have furnished any colder or more disagreeable weather. A trip to Niagara Falls to see the ice bridge and a ride over the great gorge road to view the winter scenery along the Niagara canyon was greatly enjoyed.

Just learned today that Brother Alfred Yates has left the Johnsonburg Brick Co., and is now with the Shawmut Brick Company at Shawmut, Pa. Also, that the Falls Creek Brick Co., and the Cowansville Brick Co., at Butler, Pa., have been merged into the Dubois and Butler Brick Co., U. J. Matson, president and general manager. There is a movement on foot to form a brick association of all the yards in that vicinity. They will control an output of thirty million or over. This is a grand, good move and as the parties at the back of it are all energetic business men, there is no doubt of its success. Brother Matson has sold all his brick at the Falls Creek yard. He is happy, has wintered well and hopes to come out in the spring with a bran new crop of hair and a good appetite—he lost his last one at the late concatenation of the Grand Hoo-Hoos in this city.

W. H. Signor of the Ridgeway Press Brick Company, is busy as usual, has about a million on hand, is filling some orders in the Eastern market, and says prospects for the coming season are very good.

Norton.

Written for The Clay-Worker.

BALTIMORE'S FIREPROOF STRUCTURES STOOD THE TEST OF INTENSE HEAT—STEEL-WORK INTACT.

All Will Soon be Ready for Occupancy Again.

WHEN THE first, and even subsequent accounts of the Baltimore fire were sent out over the country, the broad assertion was made that fireproof buildings in the burned district had all fallen before the fury of the flames and some of the accounts made much of the buildings, said to have been fireproof, failing to resist the ravages of the fierce fire. The skyscrapers that were protected by hollow tile fireproofing are still standing, with the steel construction absolutely perfect. It is a matter of pride, that all the buildings having withstood the tests were protected by the hollow tile fireproofing.

Despite these statements of the destruction of the skyscrapers that were protected by the standard hollow tile fireproofing an examination made by the government experts, leading engineers, architects and builders demonstrated beyond question that the skyscrapers so protected remained intact so far as the structural parts are concerned. It is stated that not one of these buildings is so badly damaged, but that it can be easily and quickly repaired. The building will show that while the intense heat of the great fire cracked and broke granite stones of huge dimensions, it had no effect on the steel construction that was protected by the standard hollow tile.

The magnificent sixteen-story building of the Continental Trust Company stood in the very heart of the burned district and those interested in the efficacy of fireproofing watched it with great interest because it was the most conspicuous type of modern construction in the city. After the fire, Mr. D. H. Durham, the architect of the building, made a personal and technical examination from the ground floor to the roof and reported that every one of the floor arches and main partitions was absolutely intact and would need absolutely no repairs. In his report of his examination he adds that that the result shows the practicability of hollow tile fireproofing for the building of a model steel skeleton skyscraper.

Mr. Hulings, who is the vice-president of the Continental Trust Company, has said since the fire: "Every fireproof part of the structure has come through unscathed and is a vindication of the claims of the hollow tile fireproofing construction. We have taken the levels of the building and find everything absolutely plumb. We expect to have the offices repaired and the building opened for business in a few days."

As to the Union Trust Company. There is in the construction of this building 800 tons of steel, and a careful investigation of the building shows that every part of this steel is in perfect condition, having been preserved by its hollow tile encasement. A glance at the "Herald" building will show how the surrounding structures succumbed to the fierceness of the flames, while it stands as a monument to the efficacy of modern construction. James Stewart, of this city, who has the contract to repair this building, which came through the hottest of the fire, agrees by contract to turn it over as good as new to the owners in thirty days.

The 13-story Calvert building, another of those that were built of steel and hollow tile shows all the floors and walls in splendid condition and the tall stately building standing, while those about, built before the invention of the standard hollow tile fireproofing, are now ashes and ruins. What has been said of these buildings may be said of all the others that were constructed in the same way. These tests of the value of fireproof hollow tile construction, and no test can possibly have been stronger, will ease the minds of those who have large sums of money invested in buildings thus protected and will serve as a lesson to those who contemplate such investments. There is not a vestige of wood left standing anywhere within the district where the fireproof buildings are, and they alone stand as examples of the superiority of modern hollow tile fireproof construction. It would seem that in the face of these facts that the days of the non-fire resisting construction, at least of skyscrapers, are gone forever.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

The year 1903, and the present one so far, has been a very complex one for all lines of trade. The brick industry had its share of trouble, but not to the extent of financial loss, though the early part of the season of 1903 was apparently going to be one that would carry loss in its track. Happily the dark outlook turned to a bright sky of business improvement that has been for a number of years a stranger to the tidewater brickmakers of the Hudson and adjacent manufacturing centers tributary to the New York brick market.

—Restless Labor—

Had for some time been a thorn in the way of the building trades, but of no greater extent than for years past, but still of such an extent that by many it was considered as a factor that told against increase of building in New York and thereby an injury to the brick trade, but as it was one of the evils of unions, they had to accept the result and say nothing. What would be the result to the brick trade was getting to be the burning question among the manufacturers, as week after week the trouble continued, and at the same time the lost time and green brick by wet weather was causing the brickmaker to think he was having more than his share of trouble. Would or would it not be in his favor, if it did not last too long? The load was getting heavy in July as the continued wet weather and the men kept leaving their jobs to find places where they could make more time. This it seemed would cause a shortage in output, but that, under the existing conditions did not count as no brick were being used. That was favorable in one way as the stock which was accumulating under the sheds would be ready for shipment. But considering all in all, there was no doubt but that there would be a shortage of many millions.

Finally a partial settlement was effected in the labor troubles and barge load after barge load was hurried to points of sale to find a market ready and willing to take them, and best of all at an advance in price. Only think of it, ready to pay more and say nothing and the labor trouble not entirely settled. The backbone of the brickmaker became rigid, he was in it once more, they wanted his stock and he had something to say about it. Finally all was settled and the brick trade moved on. The shipments were made as fast as they could make them with short help, having to stop a machine to load a barge, but each cargo brought more money and the brickmaker was a happy mortal.

—The Market—

Is frozen up as well as all points leading to it. The Hudson is out of business and the further away from the city one gets the heavier the embargo of ice. The Hackensack has 22 inches of ice in it and is as tight as a bottle, with all prospects of becoming heavier. Around the harbor it is almost impossible to move barges and as there are not enough brick to fill demand, the weather has been so cold that no bricklaying could be done, consequently no price can be quoted and the longer the navigation is kept closed, the less the danger of shortage—if there has been any.

The coming season should be one of good demand as well as good prices. It is early to judge how things are going, but straws often show how strong the wind is blowing.

From January 1st to 22d, 1903, 75 permits, cost $2,832,050.
From January 1st to 22d, 1904, 71 permits, cost $1,282,750.

A difference of four permits in favor of 1903 and $549,300 in cost does not lend much encouragement for a very large building line. Still it may improve. Of course, the price which ruled in the fall of 1903, cannot be taken as the rate prevailing, for the condition of the trade was the factor which ruled the prices, when navigation opens there may be a fall. It will be a case of supply on hand and how they will be held by the owner. If the demand is extraordinary, nothing can keep the price from going up.

—Stock on Hand—

At Haverstraw December 31, 1902	76,475,000
At Haverstraw December 31, 1903	70,330,000
Shortage	6,145,000
At Hackensack December 1902	16,150,000
At Hackensack December 1903	10,650,000
Shortage	5,500,000

If the returns from the Upper Hudson is no worse than from these two cities, the great cry of such a large shortage is not justified.

A. N. Oldtimer.

THE WISCONSIN CONVENTION.

The last convention of the season for clayworkers is that to be held at Portage, Wis., March 1st, 2d and 3d. Secretary B. H. Bright, Black River Falls, Wis., writes that elaborate preparations have been made for the entertainment of guests and that a most cordial welcome and a royal good time awaits every delegate. Visiting clayworkers from adjoining States will be warmly greeted. The following is the list of events according to the formal programme:

TUESDAY, MARCH 1.

—Afternoon—

2:00—Reception and registration.

3:00—Address of Welcome by Mayor J. E. Jones; also, F. L. Sanborn, Portage, Wis.

Response to Address of Welcome, by W. M. Ellis, Endeavor, Wis.

Committees' Reports.

Secretary's Report.

Treasurer's Report.

—Evening—

Entertainment.

WEDNESDAY, MARCH 2.

—Forenoon—

10:00—A Clay Journal Talk, by H. De Joannis, Chicago.

Discussion.

10:30—Manufacturing of Tile ,by Samuel Guenther, Port Washington, Wis.

Discussion.

11:00—Price of Brick, by J. G. Hamilton, Grand Rapids, Wis.

Discussion.

11:30—Advantage of Good Machinery, by B. A. La Dow, Chicago.

Discussion.

12:00—Outlook for 1904, by E. W. Drake, Milwaukee.

—Afternoon—

2:00—Burning Brick, by Emil Kraatz, Milwaukee.

Discussion.

2:30—Sand-Lime Brick, by T. A. Randall, Indianapolis, Ind.

Discussion.

3:00—Peace and Harmony Between Employer and Employe, by C. S. Morris, Berlin, Wis.

Discussion.

3:30—Origin and Distribution of Clays in Wisconsin, by S. Weidman, State Geologist, Madison, Wis.

Discussion.

4:00—Comparing Wisconsin Brick Industry with Other States, by Our President, F. L. Sanborn, Portage, Wis.

4:30—Appointment of Committees.

—Evening—

7:00—Banquet.

THURSDAY, MARCH 3.

—Forenoon—

Election of Officers.

Unfinished Business.

Adjournment.

PATENT SUIT.

Suit is being brought against the Hamilton Brick Co. of Hamilton, Ohio, by the Horton Manufacturing Co. of Painesville, Ohio, for infringement of their patent on their Hercules brick machine. The Hamilton Brick Co. is using a machine made by the Arnold-Creagor Co. of New London and Cincinnati, Ohio, and is called by various names such as "S. S. S.," the "New Century," the "Success," etc.

2. I. L.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

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Six copies, " "	10.00
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☞Subscribers when ordering a change of address should give both the old and new address.

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Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

XLI. FEBRUARY, 1904. No. 2.

CURRENT COMMENT.

Tiled roofs would have saved Baltimore.

* * *

Devious tracks are characteristic of other vermin than rabbits and *this* is no allegory.

* * *

There may be times when solitude is more profitable than companionship, but as a rule companionship is best. The most profitable companionship of the season was our National Convention.

* * *

President-elect W. S. Purington held the Convention in right lines. His modesty makes him an ideal presiding officer and his relation to the clayworking industry entitles him to speak with authority.

* * *

The annual address by President R. G. Eisenhart was one of the solid productions of the Convention. It was businesslike, terse, strong and dignified, and deserves a high place in the literature of clayworking.

* * *

All good stories should be continued stories. The story of the progress and advancement of the N. B. M. A. has just been carried forward another chapter. As we have said so many times, but, nevertheless, so truthfully, the last chapter is always the best.

* * *

Among the many excellent things in one of the papers read at the convention is the remark that "down-draft kilns prove very successful in that the brick that are the hottest are the ones that carry the least weight." This is quite simple, but not every one thinks of it.

* * *

Another simple statement, but one that is often overlooked, is that in a country where light colored brick is made, only darker shades would be imported, and in sections where dark brick are produced, only light colored brick will be imported. This seems obvious, but it is sometimes forgotten when making plans.

* * *

Labor unions became ashamed of the "walking delegate" and so changed his title to "business agent." Will there be any change in his character, or will he really be as mischievous, as domineering and as reckless as before he was rechristened?

* * *

With the modesty characteristic of a great machine manufacturer, J. H. Chambers, in his brilliant paper on "What Machinery Men have Done for the Brick Manufacturers," gave much of the credit to the brickmakers. It is in truth a partnership between the two, but the machine man is the "dominant partner" in progress and invention.

* * *

It is certain that not only will the problems met in the brick trade not grow less, but that they may even increase as we advance into broader fields. Not alone will there always be enough left over to keep the brain of the brickmaker busy—to quote from the address of one of our able brothers—but the exactions of improvements and new requirements will provide ample problems. These will be best and quickest solved by the men who have scientific knowledge as a basis for practice.

* * *

"Our Record of Progress," the historical sketch given by our greatest captain of industry, D. V. Purington, at the Cincinnati Convention, was a record of progress both of the National Brick Manufacturers' Association and of our craft. Not least of these is that new, and distinctly American branch, the paving brick industry, in which he stands at the very head and front. Mr. Purington says, "This remarkable growth of what is now an important and permanent part of our industry has been almost entirely the work of members of this Association." If we could suggest any alteration in this statement, it would be to omit the qualifying word "almost."

THE PASSING OF JUSTUS C. ADAMS.

In Mr. Adams' make-up there were three dominant chords: brains, practicability and friendliness. The collateral elements were many and varying. His imaginative qualities were keen and there was a visible artistic element which influenced many of his expressions. His outlook was clear, he was hopeful and buoyant. Withal, he was a large man, large in figure and large in method. His brains, his sense of the picturesque and his practicality made him a powerful character in all his relations. In his home life, in business, in politics and in general social life, he was always visible, impressive, friendly and dominant. Those who have met him in the meetings of the N. B. M. A. probably got a fairly representative view of his character. In the social life of the lobby, in the dining room with friends and in the formal proceedings of the Convention he was afforded a variety of settings which exhibited many talents. His friendliness and warmth of manner, combined with his high intelligence, made him a powerful element in politics, and if his strength had been thrown definitely and consecutively that way, none of his friends would have cared to fix a limit upon his capabilities and possibilities. As Speaker of the House of Representatives in the State Legislature during a turbulent session, he maintained the friendliness and esteem, not alone of the members of the legislature, but of all of the thinking people of the State. The alertness of his mind, his force, and tact carried him through the entire session without a break. Withal there is no man in this community whose loss has been so greatly felt within neighborhood circles. After all this is a great test. Men of great national prominence were his neighbors and some have passed away, but none leaving a higher element of friendliness and personal esteem behind them than Mr. Adams. In his death we have lost a warm friend and a wise counselor. His place will never be filled.

BRIG.-GEN. GROESBECK AND THE BALTIMORE FIRE.

All the reports from Baltimore the first and second days of the great fire expressed astonishment that there seemed no means of checking the great conflagration and wonder that such a conflagration of modern buildings of the latest type, supposed to be fireproof, could take place at all. The explanation of it and the lesson to be drawn from it are given in a letter dated February 13th by Brigadier-General of the United States Army, S. N. Groesbeck. We intended to give some extracts from this letter, but it is so admirable that it would be a mistake to omit a single line. The letter in full is as follows:

This generation has seen three destructive fires; first that of Chicago then the Boston fire and now we have that of Baltimore. The writer has been noting comments upon the Baltimore fire but has seen little in the way of explanation why it was so destructive. If the roofs of all buildings in our cities were made of thatch it would be plain to all why, a fire well started, would inevitably rapidly spread. But how much better than thatch are the roofs of the great majority of the buildings in our cities? Bearing this in mind, and fancying one's self watching the course of the Baltimore fire, the one condition that would doubtless cause the greatest apprehension with respect to the danger of its spreading, would be the burning masses of roofing hurled in a literal stream of fire along the strong currents of air over the tops of the buildings and falling upon the roofs of otherwise unendangered buildings blocks away from the nearest limit of the burning zone. The burning masses flying through the air, if examined, would be found to consist of plates and rafters, with board sheeting nailed to them; upon this inflammable sheeting is attached tarred paper, partially covered with gravel, tin, or other so-called fire-proof roofing material, but which serves only as wings to support the heavier parts of the burning roof materials in their long flight with the wind until they lodge on the roofs of other flimsily covered structures. Any one who has seen a prairie fire going with the wind has observed loose bunches of grass lifted while aflame and carried yards ahead of the line of fire, and, dropping, start the fire anew; and when the wind is strong, has observed the flames spread in this manner so rapidly as to endanger the lives of men and animals, who have to flee before them or evade them. Something like this occurs when a fire in an American city has gained large headway, thereby setting up a powerful in-draft from the surrounding atmosphere and spreading the velocity of the wind in the direction of its normal course.

It is plain that the buildings in the direction the wind is blowing are to be rained upon by the detached portions of burning roofing of the fire area, and so the horror spreads. What is the remedy? There is one safe, practicable and effective remedy. Cities should insist that business houses and residences, wherever near enough for one to imperil the other by fire, shall be covered with good old-fashioned tile, made of burned clay. Wood shingles, thin slates, thin metal shingles, all forms of tarred paper, and all such roofing, should be prohibited. Good heavy tile are the best, and corrugated iron is next in order of merit.

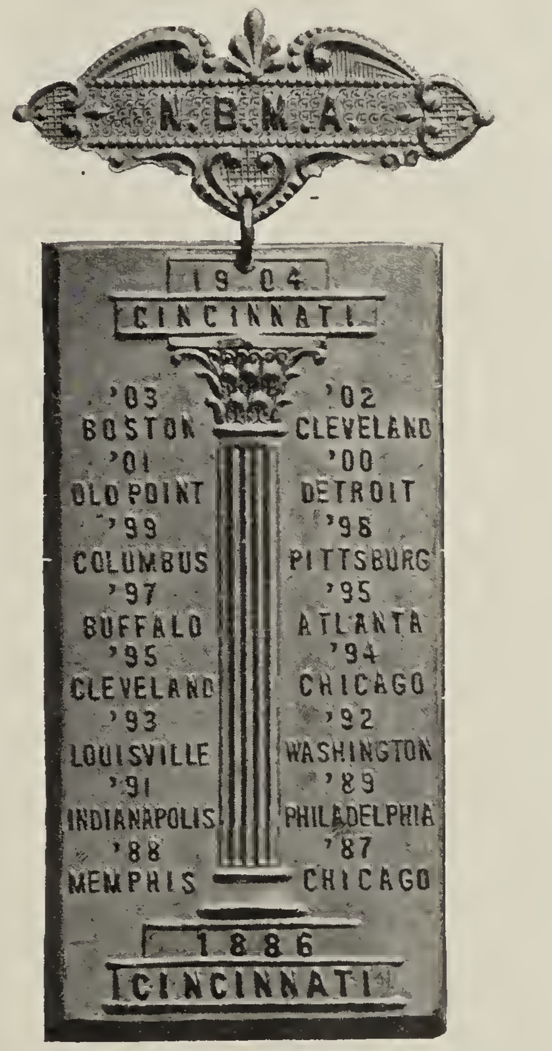
To bring the matter home to the comprehension of the unthinking, assume that when the fire in Baltimore started, all the buildings had been covered with tile. In that case the burning fragments flying through the air would have been chiefly confined to escaping inflammable contents of the burning buildings. But the greatest protection would arise from the fact that inflammable material lighting upon the roofs of distant houses would do them no injury if the roofing were of tile. Large masses of burning materials would be consumed upon such a roof, and do it no harm. Corrugated iron might be made so hot as to set fire to the supporting timbers beneath, but this could only arise in extreme cases the tile roof would be practically safe under any and all conditions. Why, then, not pass fire regulations prohibiting the use of most of the wretched materials now permitted to be used in covering buildings? It costs a little more to provide supporting timbers for the tile roof, but when once such a roof is provided it is more enduring than all others, will lessen the rate of insurance, and where generally employed, gives to a city a solidity of appearance and artistic coloring not otherwise obtainable. In the long run it is by far the cheapest. We are consuming our magnificent forests at a rate that is causing apprehension to the whole nation, and there is need for lessening the demand for wood whenever it is possible. We have unlimited supplies of clay, and if the roofing tile industry can be reasonably encouraged such tile will doubtless be supplied in the near future at low rates. As matters are today, there is not a city in the United States that is safe from like calamities to those that have befallen the cities named. It is sheer folly, worse—criminal folly—to temporize with this problem. One does not hear of frequent destructive fires in Europe, where tile is generally used for roofing. It is only in crowded communities of semi-savages, living in thatch-covered huts, and in our own country, with its boasted superior methods in the upbuilding of great cities, that such disastrous and inexcusable fires occur.

PROF. BAKER'S FINE PAPER ON BRICK PAVING.

One of the most practical papers ever prepared on the subject of brick pavements, and one presented in a manner thoroughly to cover the subject, was that by Prof. Ira O. Baker, of the Chair of Civil Engineering of the University of Illinois. The width of the pavement, the preparation of sub-grade, the foundations of concrete, gravel and broken stone, the cushion, the brick and the filler were all considered practically and scientifically by Prof. Baker. His paper will do a great deal to settle many mooted questions relating to the various details of brick pavements. Practically and constructively the brick paving question has been settled. Pavements have been made that have been in use for many years and are sure to last without expense or attention more than the three score years and ten. However, it is true that the public generally does not know this. A certain amount of variance of opinion was shown on the floor of the Convention which was not justified by recent demonstration in the history of brick paving work. The question as to the successful method of forming a brick pavement has been solved. It is now a question of educating the public, the engineers and to some extent the brickmakers.

THE SOUVENIR BADGE.

As the reader may see from the acompanying cut, the badge given to the delegates and those accompanying them, by the Cincinnati brickmakers, was a very unique and handsome souvenir of the second Cincinnati Convention. It was executed in metal with a lustrous copper finish which produced a rich color effect. The names of the various points at which conventions have been held were given on the badge and afforded a pleasant reminder of the happy times spent at the various places. What a flood of pleasant memories come to one as this little gift is contemplated, can only be appreciated by the old time members who have participated in a majority of the annual gatherings. Those who were so unfortunate as to miss the recent Convention can have one of these souvenirs as a slight compensation for their disappointment. Those desiring it are requested to notify the Secretary at once. It is hoped that those who have not yet renewed their membership will take this as a gentle hint that their attention to that detail is desired. A new and complete Pocket List of Members will be issued as soon as the roster is revised. A copy of the Pocket List will be sent to each member. It will prove a great convenience to those who wish to visit or communicate with any of the members from time to time.



DR. CONVERSE AND THE MACHINE MEN.

A very lovable old friend is Dr. A. L. Converse, president of the Springfield (Ill.) Paving Brick Co. His speeches bubble with wit and are punctuated with the laughter of all who hear. It is mostly kindly wit, but here and there, are sometimes sharp home thrusts. There was an unusually large number of these for the machine men, in his address at the Convention. Perhaps it is the perversity of human nature that makes us inclined to say the most irreverent things of those who do us the most good. There are none to whom we are more severe than those to whom we cry for help in time of sickness and danger of death. The worthy doctor has probably heard some of them. Indeed, he is readiest himself to repeat jokes upon the profession to which he originally belonged. Those who know him personally will understand that his remarks are only a good humored parody of complaining, with no more ill feeling than our shafts of wit at the doctor who snatches us back from the "Valley of the Shadow."

A NEW ASPHALT "CHICK."

The Bitulithic pavement is an adopted child of the asphalt contingent. It is a macadam pavement bonded together with a pitch concrete—one which is supposed to belong to the live-forever type. An engineer and promoter who is now engaged in exploiting this pavement says it will last for fifty years. Here, again, is the old song with variations. The asphalt pavement has lived its life. None survive without expensive repairs, none survive the ten-payment plan of paying for them. The public has been educated in this matter and the Bitulithic pavement is merely a new bait which the asphalt contingent has thrown to the public. They recognize that the game is up on asphalt and have presented a substitute. There is no question but that much of this pavement will be sold, not through its merits as a paving material, however, nor on the basis of economy, but solely and entirely because of the ability, brains and capital of the promoters. It is the story of the asphalt pavement over again. Asphalt paving material never succeeded through inherent merit. It was enticing in appearance for a short time only. The Bitulithic pavement requires a complicated plant to make the mixture and consequently will be expensive of repair. The manufacturers, however, say that no repairs will be necessary. The same thing was said about asphalt pavement and Bitulithic pavement is not essentially different from the asphalt. Broken stone is used in lieu of gravel and pitch is used instead of cement. The new pavement is another imposition, but it has to be met.

THE FIREPROOF BUILDINGS AT BALTIMORE.

Despite the fact that the newspapers insisted that the fireproof structures of Baltimore had collapsed like a house of cards, we have up to the present time and without any specific information insisted repeatedly and firmly that this could not be true, and that the fireproof structures of Baltimore were fireproof in fact. We based our judgment on a general knowledge of the character of the structures themselves. Nevertheless, newspaper reports and editorials have teemed with the failure of fireproof construction. Happily, it now appears that these structures have gone through the fire in a manner creditable to architects and builders. In another column we have an account manifestly upon good authority that is in sharp contrast with the glittering generalities carelessly set forth in the newspaper press. It is a surprise to us that these reports should not at least have been corrected within the recent past. As it is, however, hollow tile fireproofing has just had an experience that will secure friends of all advocates of good building. As it was, the generality of structures in Baltimore were miserable, indeed. Many buildings were put up on short time leases and were built as cheaply as possible. The great fireproof structures had much to contend with in these shabby structures, but beyond knocking out some glass and destroying some woodwork, no material harm was done. We are advised that the framework and the fireproofing are absolutely intact.

THE IOWA CONVENTION.

The twenty-fourth annual meeting of the Iowa Brick and Tile Association was held at Mason City, January 20th and 21st, and is reported to have been one of the most successful of this year's State conventions. The success of the sessions were due in no small degree to the kindly attention shown visitors by the people of Mason City. The special thanks of visitors were due to O. T. Denison and his son, L. W. Denison, for many kindly courtesies. A number of very excellent papers were read, all of which will be given in full in a subsequent issue of The Clay-Worker.

The following are the officers elected for the ensuing year: President, J. L. Raney, Fairfield, Iowa; Vice-President, D. F. Morey, Ottumwa, Iowa; Secretary, L. W. Denison, Mason City, Iowa; Treasurer, C. J. Holman, Sergeants Bluff, Iowa.

ST. LOUIS BRICK AND BUILDING NEWS.

BUSINESS HAS BEEN quiet during the past few weeks among the brick and terra cotta manufacturers, although there have been a number of big contracts let for brick, to be delivered quite soon.

The outlook for spring trade is particularly good unless indications are misleading, and a great deal of building will be done as soon as the weather becomes settled and the work of building can be done.

There has been no change in prices. Merchantable brick is quoted at $7.50; strictly hard and red $8.25; ordinary hard and red $8; front red and stock $18; and sidewalk and paving brick $10.

The report of the building commissioner's office for January shows that permits were issued for the erection of 58 brick buildings, to cost $501,524, and 102 frame buildings to cost $240,136. During the month of January, 1903, there were 83 permits issued for brick buildings, to cost $483,647, and for 85 frame buildings, to cost $23,785. The total estimated cost of the new buildings planned and for alterations and repairs to old ones, for which permits were issued during the past month, was $848,335. The total during January, 1903, was $581,212.

George Baker, a former well known citizen of Moberly, Mo., and for many years night foreman at Sandison's brick yard, committed suicide by firing a bullet through his brain in a pasture north of Moberly. The body was found the next morning, frozen stiff.

On account of the failure of contractors to put in a bid for the paving of Race, Second and Third streets, with asphaltum, at the letting of contracts, set for a few days ago, the Belleville Board of Public Improvements decided to abandon the plan and will substitute brick.

The Oak Hill Fire Clay Company of St. Louis, has been incorporated with a capital stock of $20,000. The incorporators are: F. W. Hodfield, 150 shares; W. R. Hallis, 1,849 shares and J. H. Studman, 1 share.

All wide-awake business concerns in St. Louis and many in other cities are putting themselves in line with the interest their patrons take in the World's Fair. Each firm has its own way of doing this. The Christy Fire Clay Company is mailing World's Fair souvenir letters to all its outside customers in which is found this paragraph: "For the benefit of our patrons, during the Exposition period, we will maintain a bureau of information and take pleasure in helping you to secure reasonable and pleasant apartments, if you will advise us of your coming."

A. Saint.

If you are in need of an experienced workman, a good place to look for him is in The Clay-Worker's "want" ad. columns.

THE OLD AND THE NEW.

THE REPRIEVE of a criminal by telephone at Sing Sing the other day just as he was about to be electrocuted has suggested the difference between that sort of thing today and as existed in the times made famous in the Waverly Novels.

Fitz-Williams bends his haughty neck above the dripping block,
Prepared to feel it cleft in twain in one sharp sudden shock,
When suddenly comes thundering across the echoing moat
A cavalier with cries of 'Stay!" exuding from his throat;
With sabre flashing through the air he meets the gleaming axe
When his pallid, prostrate prey but half an inch it lacks.
"What ho!" observes the cavalier, triumphantly, "I bring
Good news for him reposing there, a pardon from the King!"

Bill Bally sits uneasily within the fatal chair,
A third rail clamped against his feet, another on his hair;
The purring dynamo sings soft, and sizzling sparks illume
The dim and clammy atmosphere that fills the fearful room;
But just a half a second ere the button can be pressed,
And William, willy-nilly, can proceed to do the rest.
The telephone bell tinkles, and a voice exclaims: "Hello!
Bill Baily's been commuted, so shut down that dynamo!"

Oh! poetry, dust-trampled; oh! crushed and dead romance,
In these progressive, modern times you never get a chance.
For what could Walter Scott have done, had he been forced to write,
"The King took down the telephone and said, 'Don't kill that knight!'"
Electric light shines not through dreams, and on the telephone
We can't call up the visions that our boyhood days have known.
The gleaming spear, the flashing blade, the waving plume, at last
Go nodding down the corridors that lead but to the past.

MY JACKASS BOOK.

By Brian J. Dunn.

A new departure now I take, some careless ways I have forsook,
And one, to guard and keep me straight, I mean to keep a jackass book.
A jackass book, in which shall be a record of the slips I make,
With cautionings and recipes to cure me of the like mistake.

And in this ledger shall be writ, the names of things that I shall shun,
From apple jack to noisy pit and men by whom I have been done.
In letters plain and large I'll write the names who once have buncoed me,
That should they stalk me in the night, I'll save my hide and climb a tree.

First, 'mong the men whom I shall shun, I'll write him down the oily friend,
Who tells me we should work as one and wins my faith to gain his end;
The man who says, "Let's hold the price," and cuts me where I cannot look,
To save me from his next advice, I'll write him in my jackass book.

In letters plain I'll write the name of him who compliments my brain,
To push his scheme of doubtful fame with purpose sole my purse to drain.
And he, also, shall find his place, amid my select jackass list,
Whose fulsome flatt'ry to my face is false as kiss that Judas kissed.

And likewise, in my book shall go, the name of him I kept and fed,
To sting me, soon as Hungry Joe had need no longer to be fed.
And him who devil-drives his men, and cheats in count, and scales his price,
And him who stirs up trouble when t'would pay him better to be nice.

The hungry hog, the ingrate fool, the brutal boss, the traitor foul,
The crooked leader and his tool, the master mean, the stricken ghoul.
How nice for me when I can see the list of all that should be shook,
There'll be no further fear for me, when I complete my jackass book.

Will Build a New Plant.

Publishers Clay-Worker:

Enclosed find bankers money order for two ($2) dollars for our subscription to The Clay-Worker for 1904. We contemplate installing a modern plant of about thirty-five to forty thousand per day capacity, for the manufacture of stiff mud and repress brick, during the early part of the spring. We would like to correspond with several companies manufacturing up-to-date waste heat dryers, machine companies, and with some one who is practical and knows it it is practical to take waste heat from a common up-draft kiln, where wood is used as fuel, and use in dryer. Any information that you can secure for us along the lines mentioned will be appreciated. A. E. Torely.

Newport, Wash.

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WANTED, FOR SALE, ETC.

WANTED—A small or medium size second-hand steam press for making tile or pipe.
2 1 d J. H. Care Clay Worker.

WANTED—Trip hammer or Sword stiff mud brick machine. Address
AMERICAN PRESS BRICK CO.,
2 1 d St. Louis, Mo.

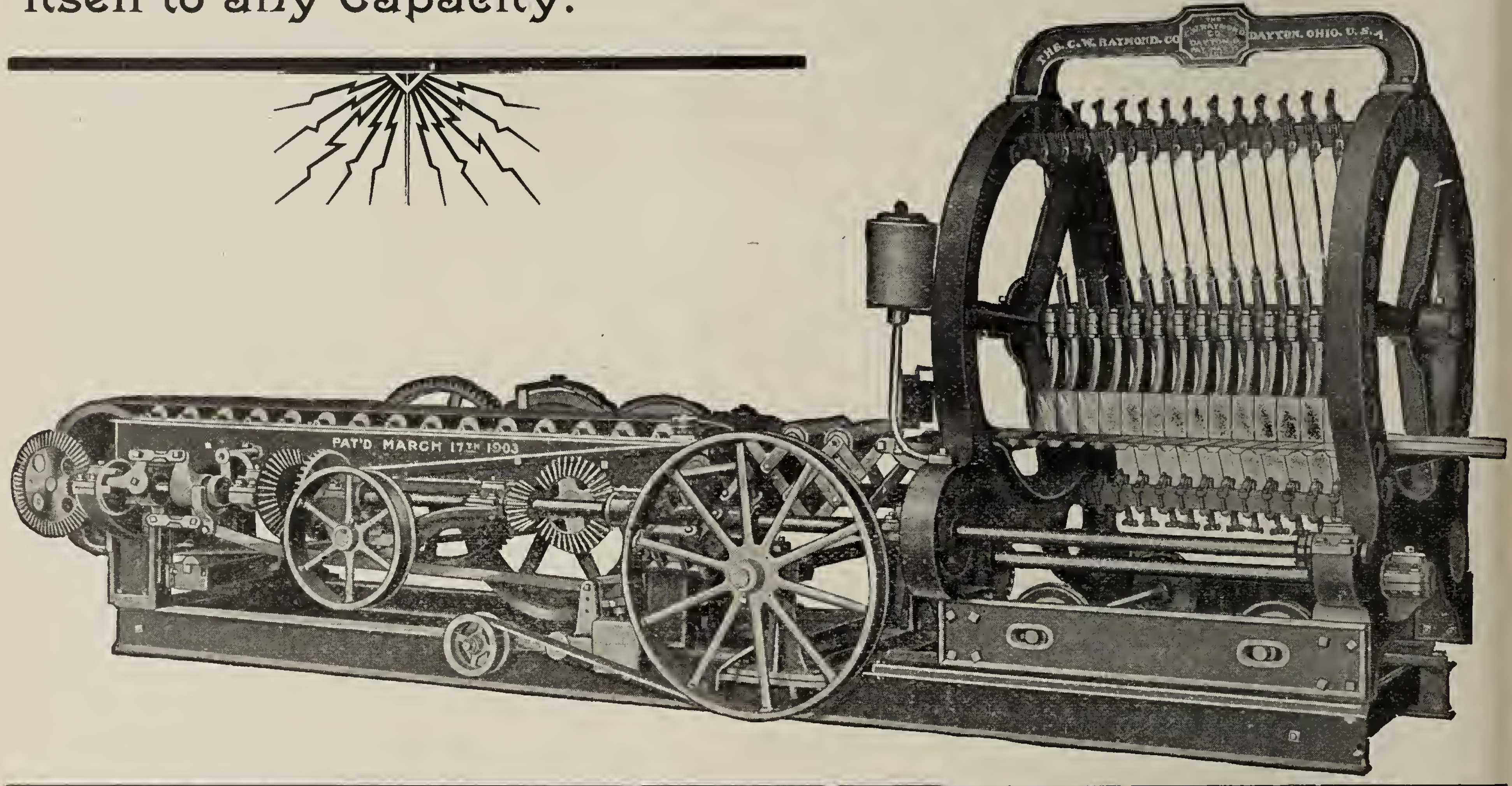
WANTED—Experienced foreman for a brick yard. One who can invest some money for a part interest in the plant. Address
E. A. JEWETT, Sec'y.
2 3 dm Fergus Brick Co., Fergus Falls, Minn.

WANTED—Position as manager or superintendent by a man thoroughly understanding the manufacture of fine front brick, by either the dry clay method or the stiff mud method; also the manufacture of fire brick, fire proofing and common brick. Thoroughly understands the different makes of stiff mud, dry press and soft mud machines, the handling of labor, the handling and building of up and down-draft kilns. First-class references furnished. Would prefer a position in the South. Would like to hear from any-one in want of a first-class man. Address,
1 1 d V. V. C., care Clay-Worker.

For Sale, Wanted, Etc., Ads Continued on Pages 296, 300 and 301.

YOU CAN MAKE GOOD BRICK

just as cheaply as poor ones, and get more for them. Isn't it a business proposition, therefore, to equip your plant with machinery that will make the **Good Ones**? It costs no more and the results are tenfold better. This Cutter has a down shear cut. Cuts true to line and leaves no feather edges. It has a continuous rotary motion and regulates itself to any Capacity.


THE C. W. RAYMOND CO.
DAYTON, OHIO. U. S. A.
PAT'D MARCH 17TH 1903

The RAYMOND AUTOMATIC CUTTING TABLE

THE C. W. RAYMOND CO., DAYTON, OHIO, U. S. A.

BOSTON, MASS., July 24, 1903.

THE C. W. RAYMOND CO., Dayton, Ohio.

Gentlemen :—We are pleased to state that the Automatic Side Cutting Machine which you installed at our plant at Dover Point is a success. We are no doubt making brick of a clay which is difficult to manipulate. It will not bear great pressure without distortion.

The first cutter we used was driven by the clay bar itself, and swelled the bar very badly out of size and shape so that the bricks were delivered with great variation as to length and height. With your cutter, however, which is driven positively from the Brick Machine itself, the speed being regulated by the governor to correspond with the travel of the clay bar, all of these difficulties have disappeared and we are getting a perfectly square and even size brick, cut true to line, and we can moreover use the clay in a very soft condition.

Altogether, we can heartily recommend your cutter to any one desiring to make a first-class wire-cut face brick.

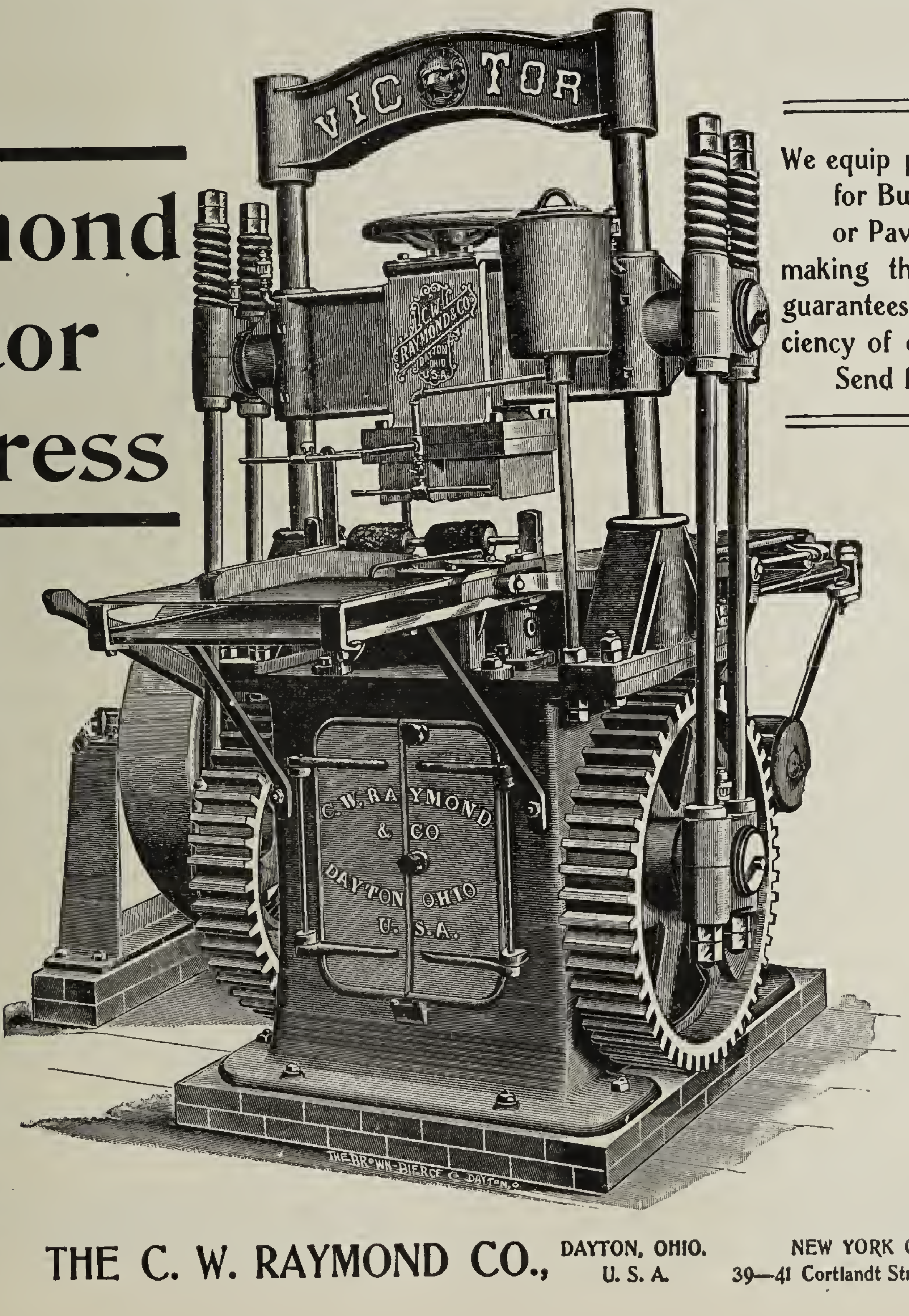
Very truly yours, THE FISKE BRICK CO.

THE VICTOR RE-PRESS

Do You Re-press your Brick? Do you give them the smooth surfaces, the square corners, and keen edges necessary to make a high-class brick? Do you recognize the worth as an advertisement, of your distinguishing imprint upon each brick? All these advantages can only be had by re-pressing. Re-pressing enhances not only the beauty of the brick, but their utility and sale value. The Victor has attained an unequaled distinction and had a phenomenal sale for this class of work. Its advantages and conveniences are so manifold, as to place it in a class by itself. The first machine that meets your eye on a well-equipped brick plant, is a VICTOR RE-PRESS. IT IS A MONEY MAKER AND A MONEY SAVER

Raymond Victor Re-Press

We equip plants complete for Building, Fire or Paving Brick making the most liberal guarantees as to the efficiency of our machinery. Send for Catalog


VIC TOR
C.W. RAYMOND & CO. DAYTON OHIO U.S.A.
C.W. RAYMOND & CO DAYTON OHIO U.S.A.
THE BROWN-BIERCE C DAYTON O

THE C. W. RAYMOND CO., DAYTON, OHIO.
U. S. A.

NEW YORK OFFICE
39—41 Cortlandt Street, Room 40

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING NEWS.

AT THE PRESENT time of course building operations are very slack, on account of the weather, but the winters are so mild in this city that hustlers among the contractors are able to work a great many more days in the winter than they are compelled to lay off. There was little weather before the last week in January to cause a loss of time on building operations, and since that time there has been a good many days favorable for the builders, even on outside work.

There now appears to be nothing in the way of a veritable building boom for next year, unless it would be labor troubles. Of course a big strike would not only stop all building operations for the time being, but it would at once cause investors to stop figuring and cause many enterprises which now look like a sure thing to be postponed indefinitely. It is thought, however, that the labor question is in good hands in this part of the country, and that the men will see it is to their interest to continue at their present good wages, and have plenty of work, in preference to striking for better conditions, be forced to lose at least a part of the best wage-earning season, and then even if they gained their ends, so frighten the men who have capital to invest that they will give up building ideas, and turn their capital into other channels.

The Employers' Association has gained an enviable membership, and will be a factor in the future which must be reckoned with by all trade unions, and if they gain the reputation of being absolutely fair in their decisions, they will have the backing of all right minded people.

There are a good many miles of streets in this city, in which the sewer work has been completed, and where paving is needed, and it is thought the next city administration will be likely to push that class of work. Little was done along these lines last year, so there is a considerable accumulation.

A big sewer district contract has been let, and the W. S. Dickey Clay Manufacturing Co. has secured the contract for the sewer pipe.

The Pittsburg Brick Co. reports the landing of a contract for 1,400,000 paving brick, to be laid in the streets of Shawnee, Okla.

At the recent election of directors held by the Employers' Association, at which 6,030 votes were cast, the name of Fred L. Dickey, of the W. S. Dickey Clay Manufacturing Co., was one of those selected.

The Gulf Elevator Co., which is building a large new grain elevator in this city, is receiving brick from the Pittsburg Brick Co., having placed a contract with them for 900,000. They are facing the entire building with vitrified brick, and the balance of the brick used will be the regular Sycamore brick.

The four mantel and tile dealers of this city recently met at the rooms of the Employers' Association, and it is likely they will join the association, for the protection afforded against labor troubles.

G. H. Mahan, who has been in charge of the Brickton, Kas., plant of the Coffeyville Brick and Tile Co., has been engaged by the Pittsburg Brick Co. as superintendent of the plant at Sycamore, Kas.

It appears, from advices received by manufacturers in this city, that the Government, in its irrigation development in the West, is about to become a manufacturer of both cement and tiling. Word comes from the Salt River dam, which is being constructed in Arizona, that the cost of getting material on the ground is so heavy, the dam being located about forty miles from a railroad, that the engineers are figuring on drawing on the natural resources of the country. There appears to be good rock for the manufacture of cement within half a mile of the dam, and plenty of shale is near at hand. There is nothing said about the necessary fuel for making sewer pipe, but that would cost a good deal, if it is not to be had from near-by sources. It is said to be the great expense of getting both cement and tiling on the ground that has caused this figuring, and not the original cost of either.

T. H. Gwynne, the superintendent of the Pittsburg, Kas., plant of the Pittsburg Brick Co., has been taking a vacation of about three weeks, and is attending the National Brickmakers' Convention at Cincinnati.

Rosedale, a suburb of Kansas City, is going to have some brick sewers. The contract has already been let for one 1,000 feet long and three feet in diameter for Rosedale avenue, and an arch pattern sewer 5x3½ feet, is to be put in on Wesport avenue, and will be 800 feet long. The Rosedale avenue contract was let to Bosman & Lightfoot.

Flanagan Bros. made the lowest bid for the brick work on the new Turkey Creek pumping station, their bid being $18,963.50.

The Contractors' Supply Co. has opened for business at 309 Postal Building, and will do a general jobbing business in building material, including brick, tile, sewer pipe, wall coping, etc. They will be manufacturers' agents and jobbers, and should be in a position to do a good business and find a market for the output of outside brick factories who want to sell in Kansas City. Charles Roll, who has been with the Kansas City Hydraulic Pressed Brick Co. for a good many years, is the manager of the new concern.

The price of brick has dropped a little lower than it has been, and the following figures represent the market at this time: Common Salmon, $6. per M.; red and hard, $7; select reds, 2¼ inches thick, $11; vitrified, $13; first quality red pressed brick, $16; second quality, $13; semi-vitrified, $18; chocolate, $20; granite, $20; buff, $23; grey, $24.

A decision was rendered by the Kansas City Court of Appeals a few days ago which should be of considerable interest to the trade. It was the case of A. J. Powell, a Linn county farmer, against the Brookfield Pressed Brick & Tile Co. and the court has decided that "the right of one to be secure against the poisoning of the air by noxious smoke is as complete as is the right to be protected against open personal assaults." Powell sued for damages alleged to have been caused his corn crop by the smoke from the defendant company's brick kiln. He won in the lower court and the verdict has been affirmed by the court of appeals. The plaintiff based his case upon the allegations that the brick factory used an inferior grade of coal and was negligent in the care of its fires and kilns. The crop alluded to in the complaint grew upon a ten-acre tract which is separated from the property of the brick company by a railroad track. The entire loss of the crop was shown in the trial of the case to be solely attributable to the withering effect of smoke and further evidence was produced to show that the nuisance might have been abated with the exercise of due diligence. The decision will probably result in a deluge of damage suits in smelter and manufacturing towns.

SUCCESS IN DRYING BRICK.

MANY A BRICKMAKER knows from sad experience that one of the chief sources of loss in manufacturing is due to the improper drying of the green brick. The National Dry Kiln Co., of Indianapolis, Ind., is prepared to offer substantial relief from this sort of brickyard trouble. They offer a natural draft steam heated brick dryer that is doing fine work on many yards throughout the country. Their dryer can be adapted to any special yard conditions and equipments. The air is admitted to the dryer through a slatted floor and is heated by coming in contact with steam pipes underneath the cars. The pipes are all above the cross ties, and it is claimed that by this means every heat unit available passes through the loaded cars, and besides this, the expense for excavation, masonry, etc., is obviated. By an ingenious placing of the various heaters, perfect control of heat is obtained.

This company makes a specialty of furnishing everything required by a dryer, including steel deck cars for waste heat dryer, also hot blast dryer cars. They claim for their cars superior quality of material, workmanship, strength and service ability. They will be pleased to send any reader of The Clay-Worker desiring it an illustrated pamphlet which will convey better than words the superior character of these cars.

Some of the recent shipments made by the National Dry Kiln Co. are a 12-track dryer to the Hankinson Brick Co., Augusta, Ga. A 4-track dryer to the A. G. Kahn Brick Co., Selma, Ala., a 6-track dryer to J. B. Prullage, Vincennes, Ind., an 8-track dryer to the Drew Brick Co., Monticello, Ark., an 8-track dryer to the Berry Bros. Brick Co., Columbus, Ga., a 10-track dryer to the Swoyer Brick Co., South Bethlehem, Pa., and a 10-track dryer to the St. Paul & Tacoma Lumber Co., Tacoma, Wash.

The National Dry Kiln Co. is in receipt of many letters of endorsement, and submit one of their latest, which proves that the National is all right.

St. Paul & Tacoma Lumber Co., Tacoma, Wash., Jan. 29, 1904.
The National Dry Kiln Co., Indianapolis, Ind.

Gentlemen: We are pleased to submit the following report from our Brick Yard Manager covering the National Brick Drier, which we purchased from you, viz:

"I am very much pleased to report that the drier is working satisfactorily. In regard to the exhaust steam which we use during the day, I wish to say that it is a complete success and a great saving on fuel. Before we installed the dryer our exhaust steam was wasted.

"In conclusion I wish to say that I am well pleased with the drier, as we can make and dry brick every day, rain or shine, and can make brick all the year, while before we got the drier we could only make and dry bricks five months in the year and had to depend upon the weather."

Yours truly,
E. G. GRIGGS, Second Vice President.

The Nationl Dry Kiln Co. is also equipping many plants with the patented steel foundation, which removes all wood work from below the ceiling line. This feature is shown in the cut in their ad on page 291, to which the reader is respectfully referred. Those desiring further information are requested to address the company direct, mentioning The Clay-Worker.

From Over the Border Line.

Editor Clay-Worker:

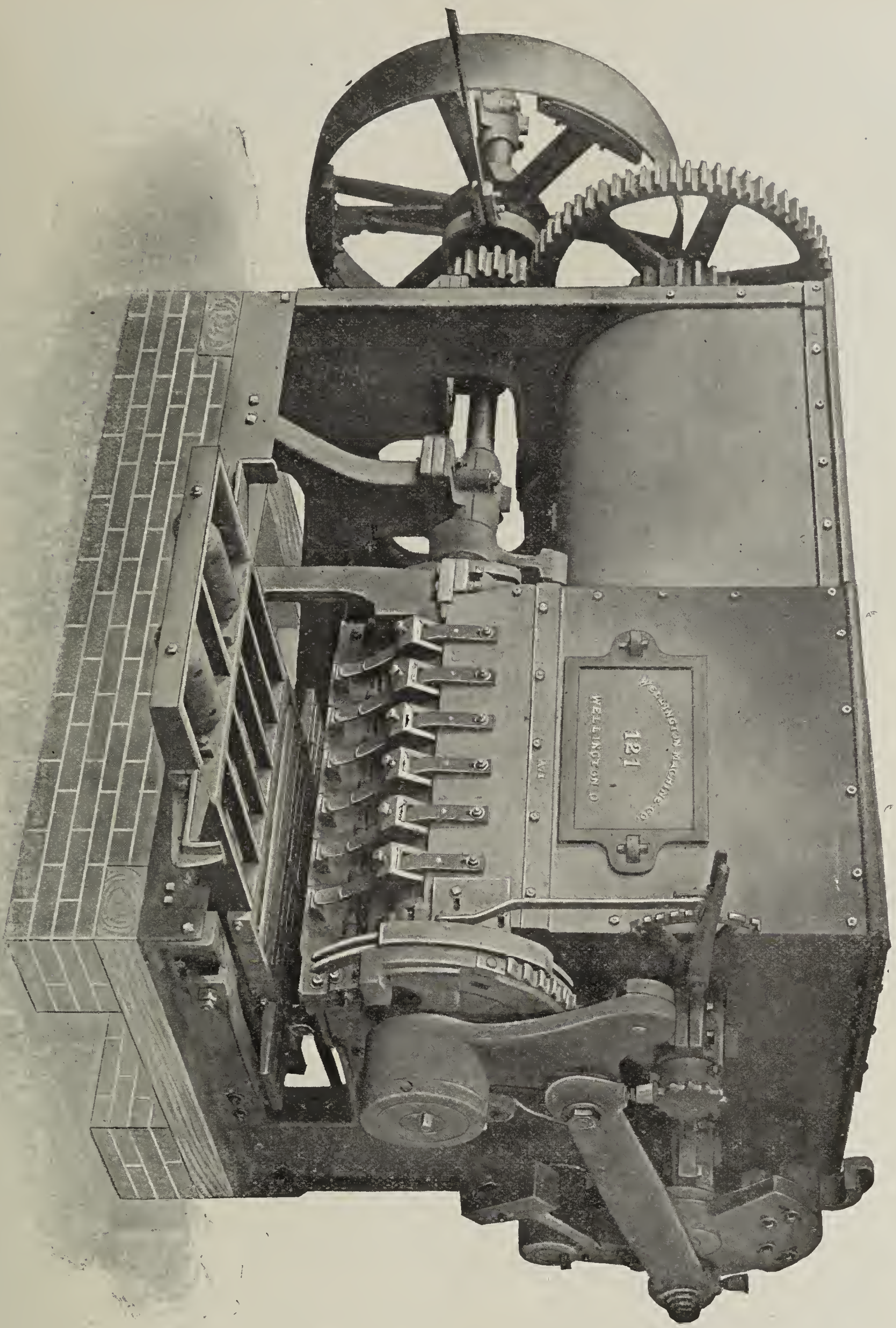
Enclosed find money order for $2 in payment for another year's subscription to The Clay-Worker, as we can not get along without it. Business has been very good with us for the last season, and prospects are good for another season.

——————, Ontario. M. OTT & SON.

OVER
175
"Monarch"
Brick
Machines
in use.

OVER
500
"Quaker"
Machines
in use.

WRITE
to us
regarding
Disintegrators,
Pug Mills,
Mould
Sanders,
Sand Dryers,
Smooth-roll
Crushers,
Moulds,
Barrows,
Trucks,
Winding
Drums,
Dump Carts,
Elevators,
Dump Tables
and all
kinds of
Kiln
Castings.



The "Big No. 6" "Monarch" Brick Machine.

REMEMBER:
You are losing money wheeling brick unless you have our
ROLLER-BEARING BARROWS.

The Wellington Machine Co.,

WELLINGTON,
OHIO.

Send for Catalogue.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE OUTLOOK FOR San Francisco brick manufacturers is on the whole highly encouraging, and, there is now little doubt but what business activities will be about as great during the present year as it was last year. Less fear is now expressed as to labor union troubles than was the case last year, and this, together with the fact that all of the large buildings just completed have found ready occupants has been an inducement to builders. Architects predict that building activity will be good and the results so far bear out these predictions. The fact that rains have now fallen quite generally throughout California relieving the fear of drought, which had crippled some lines of business, had also added to the feeling of confidence.

The Richmond Brick Co., with works at Point Richmond, Cal., and San Francisco offices at 122 Davis street, has orders ahead for 2,000,000 brick. These are for building purposes in San Francisco. The company is putting up a patent kiln invented by Mr. Cary of the firm, at its works at Point Richmond. It is an up-draft and down-draft kiln which differs from other kilns particularly in that both oil and coal are used.

The Carnegie vitrified brick has been accepted by the United States Government for paving about 185 feet of street connecting with the new postoffice building on Seventh and Mission streets. This is the first vitrified brick which the Government has accepted on this coast.

Bush & Mallet Co., dealers in fire grates, tiles and parquette flooring, now occupies quarters in the new Crossley Building at 618 Mission Street.

The Los Angeles (Cal.) Stoneware Works, located at Los Angeles, Cal., is pereparing to enlarge its manufacturing plant and orders have been placed in the East for eight carloads of new machinery. Three new kilns are to be built and the company will then have one of the best equipped sewer pipe factories in California.

Investigations have been going on for some time past with a view to discovering clay in the vicinity of Douglas, Ariz. A large bed of this product has been located and the locators are preparing to develop the find, which is of very good quality.

C. E. Nelson, who conducts a brick yard at Weston, Ore., reports that during the year 1903 the output of his yard was 4,000,000 brick. Mr. Nelson is pleased with the outlook for business and states that the gain for 1903, over the preceding years, was 1,000,000 brick.

Peter Jenson, of Patagonia, who is interested in the clay deposits of Benson, Ariz., has been in that city for the past few weeks, attending to business interests.

C. B. Langstaff, of Elsinore, Cal., has been in Whittier for some time past, getting out samples from his new clay beds above Warm Spring Valley.

The Independent Brick Co. has filed articles of incorporation in San Francisco with a capital stock of $150,000, of which $100,400 has been subscribed. The directorate of the new company includes the following: H. S. Van Dyke, C. Allen, C. Forrester and C. L. Slagle. The principal place of business is Los Angeles, Cal.

Cris. Bowles, of Imperial, Cal., has opened a brick yard at that place and has made a contract with the town of Brawley to manufacture 100,000 brick, which will be used in the erection of buildings and public improvements.

An oil burner has been installed in the kiln of Harbour & Peterson, brick manufacturers of Imperial, Cal.

H. H. Taylor, formerly secretary and treasurer of the Sandpoint Brick Co., of Sandpoint, Iowa, has begun suit against the company for $2,350, which amount it is alleged is due for money and services.

The Orange County Tile Co., whose works are located at Wintersburg, near Santa Anna, Cal., is now turning out 10,000 tiles per week, and is arranging to increase the capacity of the plant. The company reports good sales as far out as Arizona.

It is reported that two new brick plants are in prospect at Boise, Ida. Asa Newbanks has plans perfected for installing a new plant on which it is said work will begin in the near future. W. A. Davenport, who promoted the Vitrified Brick Co. at Boise, is considering the proposition of putting in another plant. As it is, the output of the two brick factories now in operation is entirely used up. The plant of the Vitrified Brick Co. has a capacity of 30,000 bricks per day and the Foster brick plant has a capacity of about 25,000 brick daily.

Reports from Florence, Ariz., state that Charles Udell is organizing a company to work the deposits of fire clay, aluminum clay and kaolin in the Son Pedro River near Florence.

The suit of Jacob Stoll, San Jose, against the Kimball Brick Co., of the same place, has been decided against the company. Mr. Stoll claims that the smoke, heat and gases generated by the company's kilns has caused material damage to his orchards. He asked for $500 damages and a perpetual injunction. The court granted the injunction restraining the company from burning anthracite and bituminous coal in its kilns, but assessed the damages at only $54.

The trouble over the awarding to C. Forrester of a contract to supply the city of Los Angeles with 20,000,000 brick to be used in the construction of an outfall sewer is still unsettled. Mr. Forrester, so far as known, is not an owner of a brick yard of sufficient size to fill the contract, and although he claims to be able to fill it, the city council has not yet accepted his bond. When the bond was presented a few days ago it was decided to hold the mater up and to have the bond amended in several important particulars.

Sewer pipe manufacturers who have been figuring on the construction of the proposed storm drains in Los Angeles, are now of the opinion that the drains will not be built. The city voted bonds to the amount of $400,000 for the construction of these drains, as a part of a large bond issue all of which has been sold except that portion to be used in the construction of storm drains. The excessive dry weather and the general business reaction has had its effect on the city council and it is generally believed that if these bonds are not sold to the syndicate which has an option on them they will be cancelled. The option expires on April 1st.

SUNSET.

San Francisco, Feb. 5, 1904.

An Up-to-Date Plant in Texas.

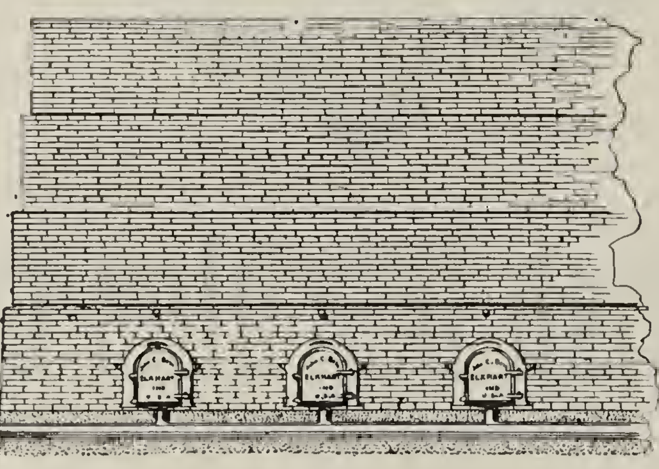
Editor Clay-Worker:

Could you send me the November, December and January Clay-Worker? I would like you to send it to me regularly beginning with the November number. We are progressing nicely with our plant. We have 3,300 feet of switch to our plant completed. Our clay shed is nearing completion, it is 193x72 feet, covered with galvanized iron. Our machine, engine and boiler building will be covered and sided with the same material. We are now putting up our Ross-Keller machine, dry pan, etc. We are also putting in an experimental pottery and stone ware plant, and have every reason to believe that we have the finest of clay for the different kinds of stone ware. We expect to add fire proofing also.

Our clay is pronounced to be the best in Texas. We have fifteen or twenty different kinds of Buff burning clay, we own 130 acres and have a certainty of fifty feet in depth. I think we have a six foot vein of kaolin. We also have a clay in great abundance, that I am told is Cornwall clay, it burns a light cream color and is almost pure, the clay when wet is almost black. If our stone ware turns out to be the right material we will erect a first-class modern pottery. Wishing you a prosperous year,

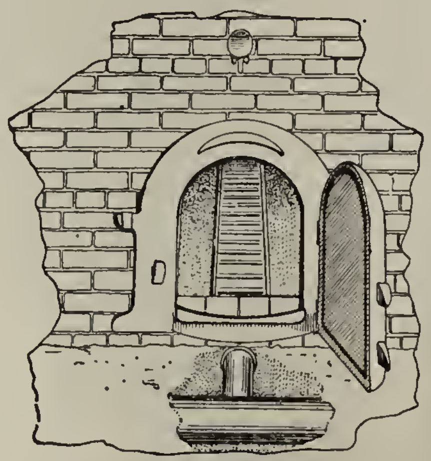
J. B. MORRISON.

Supt. of the Elgin Butler Brick & Tile Co. Elgin, Texas.



The Boss System of Brick Burning

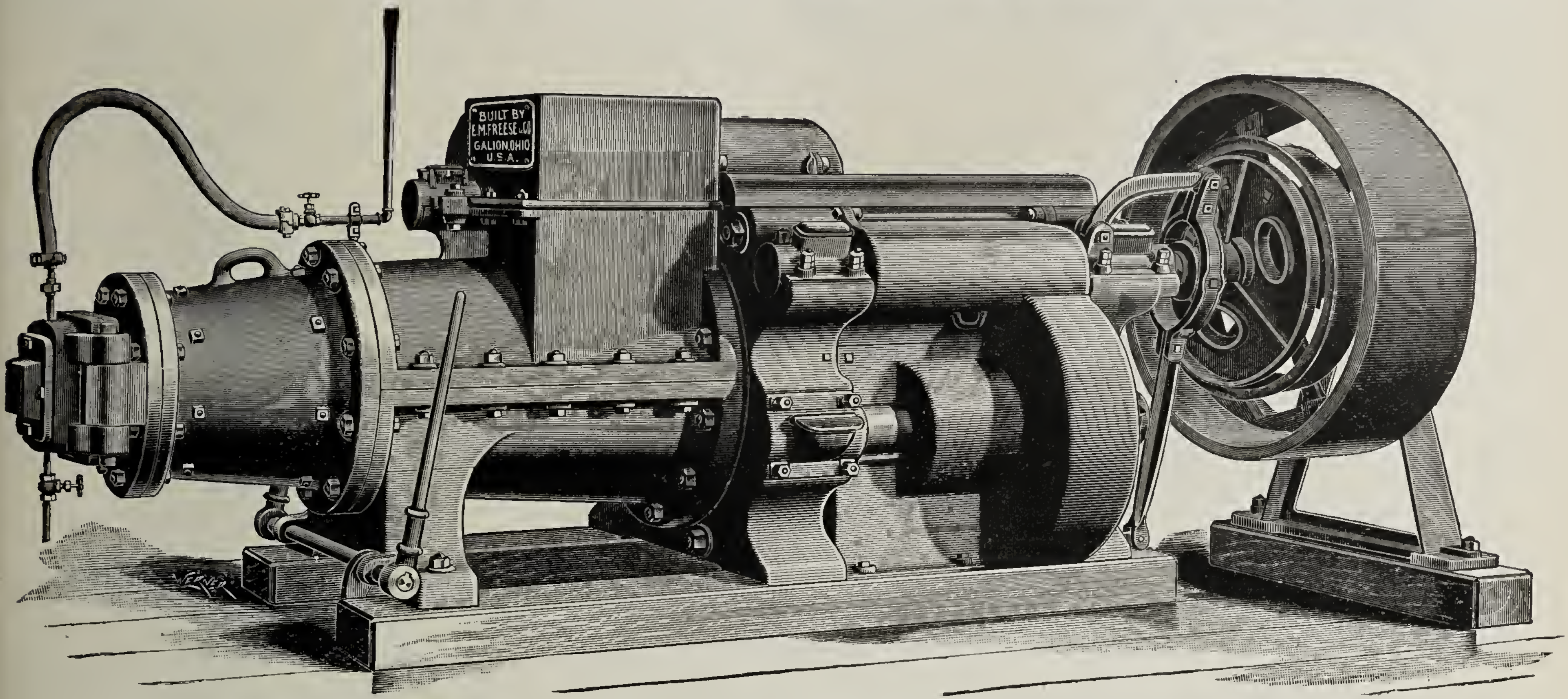
requires no outside furnaces which are expensive to build and maintain; will burn slack and poor grades of fuel which can not be consumed with success in any other manner.



Send for . . .
Descriptive Catalogue.

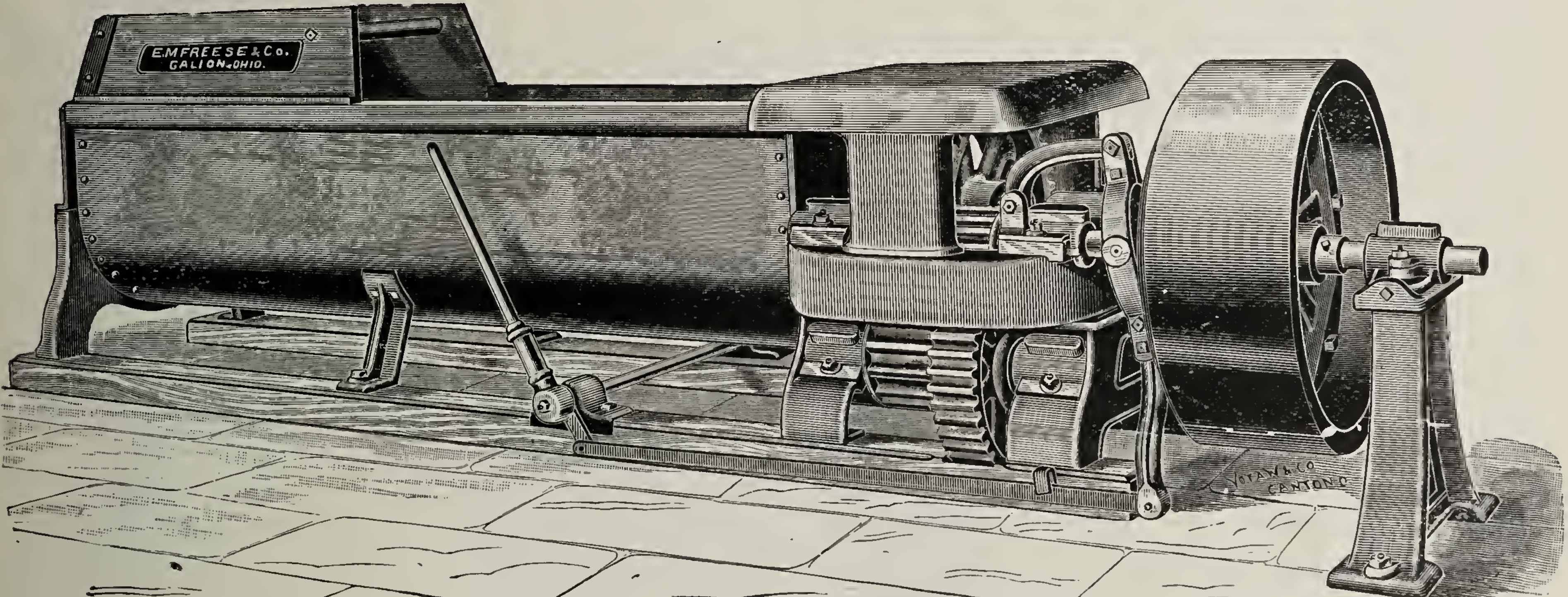
JOHN C. BOSS, Elkhart, Indiana, U. S. A.

Our Mammoth Brick Machine



THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

Our Pug-Mills Have Features of Great Merit.

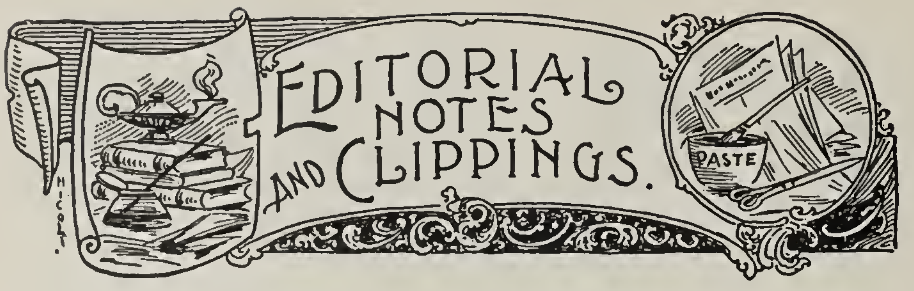

E.M.FREESE & Co.
GALION, OHIO.
VOTAW & CO.
CANTON O

THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 340 and 341.



EDITORIAL NOTES AND CLIPPINGS.

The Iowa Granite Brick Co. has been incorporated in Clinton, Iowa.

J. A. Wilson, Spencer, Iowa, will establish a brick and tile plant at Clarion, Iowa.

H. W. Brower is about to sell out his brick manufacturing plant in Casey, Iowa.

A fire destroyed part of the dry kilns of Arkansas Brick Company at Little Rock, Ark., entailing a loss of $1,000.

E. R. Wiswell has purchased the tile plant of J. C. Mundie at Manson, Iowa, and will operate the same in the spring.

Mertz & Fletcher is the name of a new company formed to operate the tile plant of L. H. Battefeld at Bucyrus, Ohio.

The Shield Brick and Clay Co. has been incorporated at Willoughby, Ohio, by R. L. Conley, T. N Lewis, A. H. Wyatt and others.

Richard Comey, a prominent brick manufacturer of Fishkill Landing, N. Y., died at his home in Dutchess Junction, N. Y., aged 70 years.

P. A. Mattson, Ogden, Utah, writes us that he is in the market for a wire cut brick and tile machine that will work the clay without having it ground first.

The Star Brick plant of the Harbison-Walker Co., Portsmouth, Ohio, was burned to the ground the night of January 23. The loss is estimated at $30,000. The plant will be rebuilt at once.

The plant of the Chelsea Pottery at New Cumberland, Ohio, was almost entirely destroyed by fire January 29, causing a loss of nearly $200,000. The pottery was one of the largest and most prosperous in the Ohio valley, employing about 350 people, and was owned by the Union Pottery Co. The flames broke out in the roofs of the kilns and spread with such rapidity that within an hour the entire plant was doomed.

George Denoncour, the brick manufacturer, died at his home in Westville, N. H., recently, death being the result of a shock which he suffered a few days previously.

The Spahr Pressed Brick Works has been incorporated at Maysville, Ky., with $100,000, by A. C. and E. S. Spahr, S. M. Hall, E. A. Robinson and Frank O. Blakely

The plant of the Buckhannon Brick Co. at Morgantown, W. Va., was completely destroved by fire recently. The plant had only been in operation about two months. They will probably rebuild at once.

The Jeffrey Manufacturing Company, of Columbus, Ohio, through its connection with the Ohio Malleable Iron Company, of the same place, is now in the field soliciting orders for high grade malleable castings.

At the annual meeting of the La Prairie Brick Company, Montreal, Canada, January 18, Peter Lyall, J. W. Tester, T. A. Trenholme, A. A. Ayer, Paul Gailbert, John McKergow, John Forman were elected directors.

J, R. Wade, Brick contractor of San Diego, Cal., will operate the Rose Canyon brick yard the coming season. Mr. Wade purchased this plant several years ago, but has never thought conditions justified operating the plant until now.

The first kiln of brick has just been cooled at the new brick plant in Parsons, Kansas. The plant has a capacity of 20,000 brick per day, and is furnished with a 125-horsepower Corliss engine. The plant expects to find a market for the greater part of its product in Parsons.

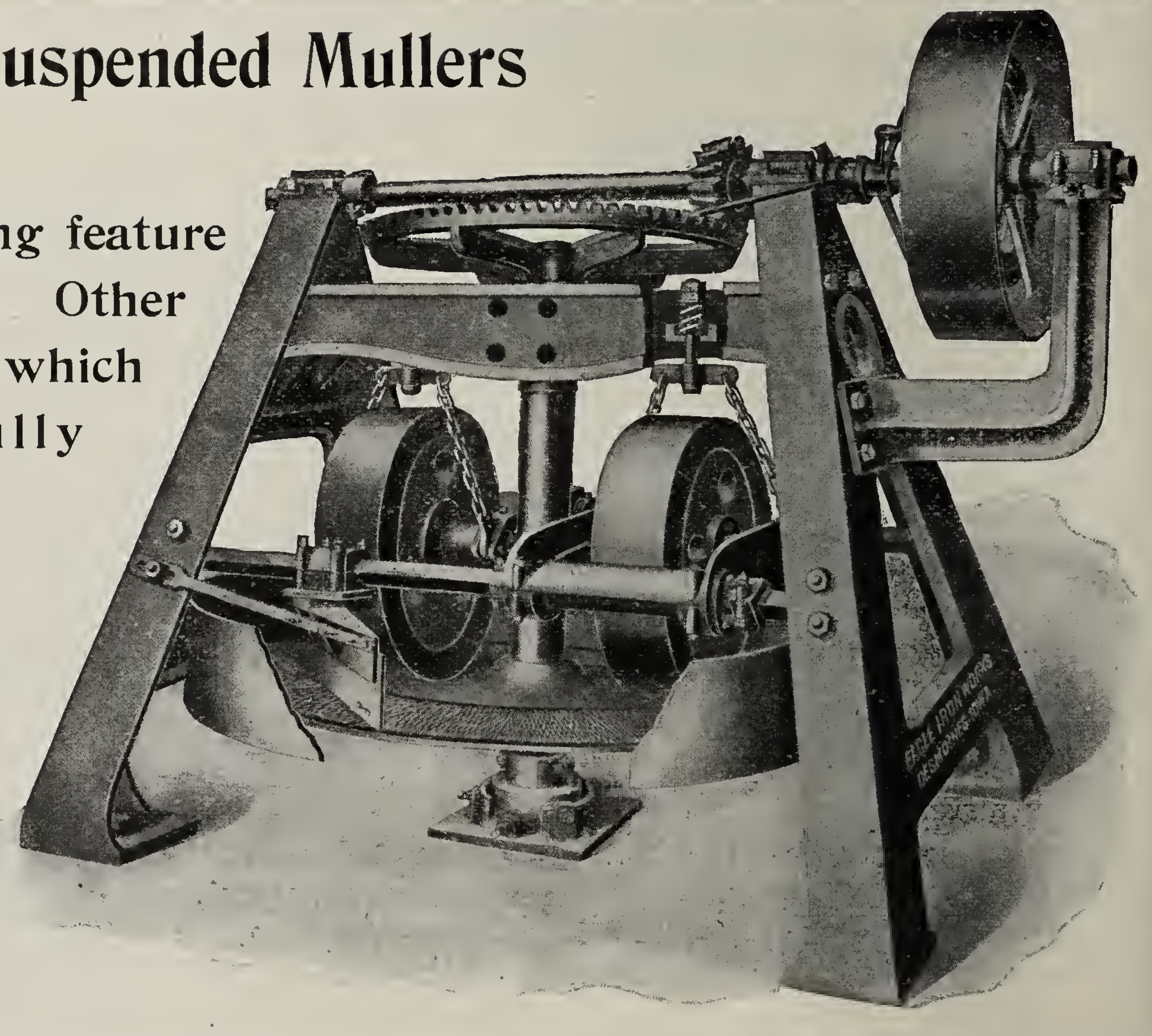
H. H. McClure died suddenly at his home in Rome, Ga., January 13th, as the result of a stroke of paralysis. Mr. McClure was one of Rome's most prominent citizens and was secretary and treasurer of the Rome Brick Company. He was 48 years of age and leaves five children.

In renewing subscription to CLAY-WORKER, J. C. Sauseman, Newport, Pa., writes that they have incorporated the firm formerly known as Sauseman & Trout and will hereafter operate under the name "The Juniata Brick and Tile Co." Mr. Sause-

[CONTINUED ON PAGE 292.]

Independent and Suspended Mullers

The distinguishing feature of our Dry Pans. Other valuable features which our catalogue fully describes.



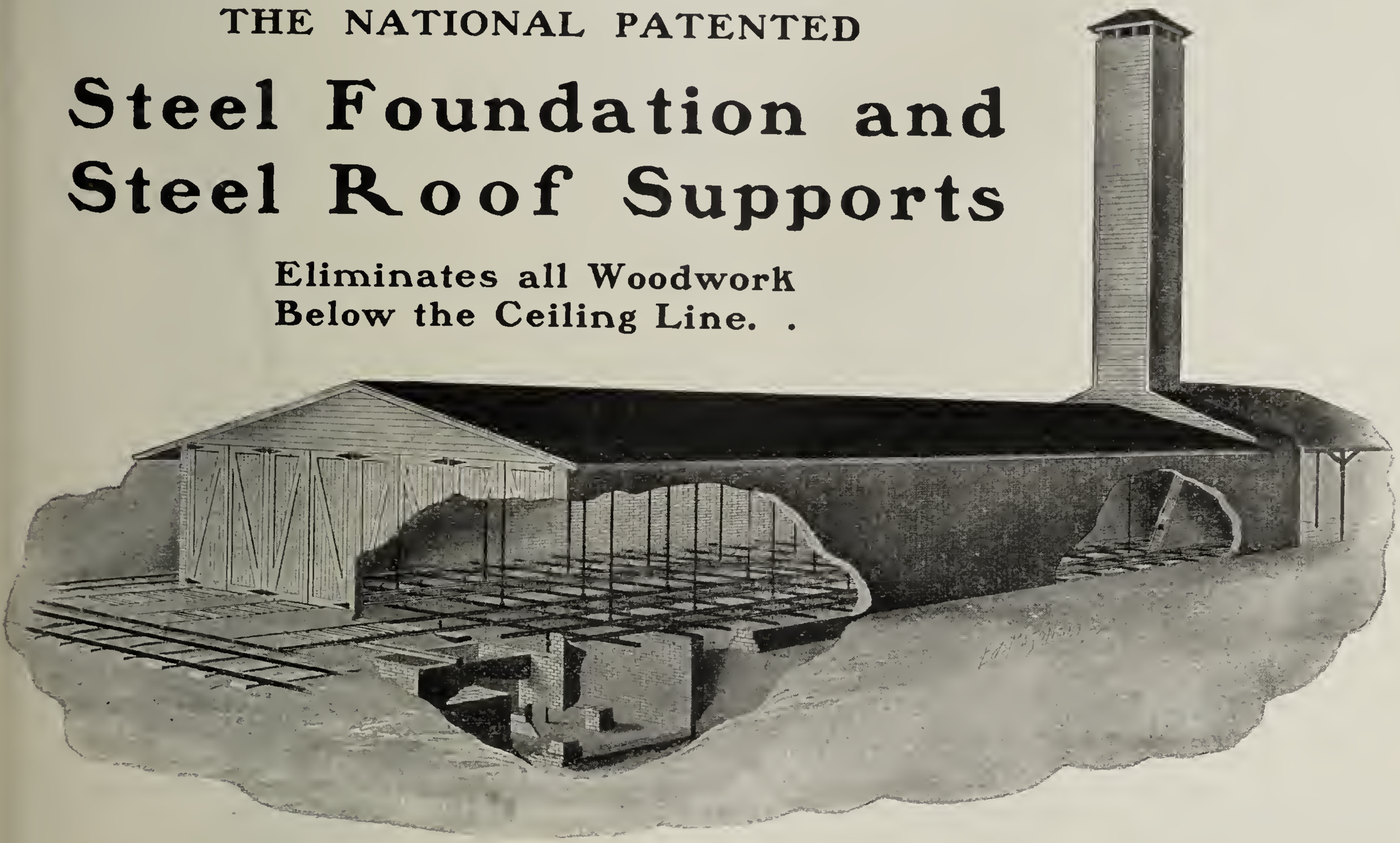
EAGLE IRON WORKS, Des Moines, Ia.

The National Brick Drier

THE NATIONAL PATENTED

Steel Foundation and
Steel Roof Supports

Eliminates all Woodwork
Below the Ceiling Line.



Dry Your Brick with Exhaust Steam
and Save Money.

We manufacture a full line of cars. In their construction nothing but the best of material is used and workmanship unsurpassed. We cover the field. Here is the list: Steel Rack Double Deck, Single Deck, Steel Decks for Direct Heat Driers, also Cars for Sand Lime Brick, Transfer Cars and Turntables.

The National Drier and Cars are Endorsed by Representative Brick Makers Throughout the Country.

Write for Descriptive Catalogue. A Postal will bring it.

The National Dry Kiln Company

C. H. BEALE, Southern Manager, Montgomery, Ala.
JOHN McKAY, Representative at Large.
TATUM & BOWEN, Pacific Coast Agts., Portland, Ore.,
San Francisco, Los Angeles, Cal.; Seattle, Spokane, Wash.

1118 East Maryland Street,
INDIANAPOLIS, IND.

See Ad on Page 318.

EDITORIAL NOTES AND CLIPPINGS—Continued.

man says prospects are bright for a good business the coming season.

T. J. Neiswanger has purchased a tract of land at Washington, Iowa, on which he will erect a brick and tile plant at a cost of $15,000.

The Winamac (Ind.) Cement Pressed Brick Co. has been incorporated by S. A. March, G. T. Bouslog, Milo Bond, Charles Weeks and M. M. Hathaway.

The Rockwell City (Iowa) Brick and Tile Works has recently been incorporated by Jos. A. Steinberger, Geo. L. Brower and others. Capital stock $27,000.

The large plant of the Jackson (Miss) Pressed Brick Co. was destroyed by fire early this month. J. E. Bartlett, the manager of the plant, estimates the loss at $40,000, with $4,000 insurance. He says they will rebuild without delay.

Wm. G. Mawhinney, a well known brick manufacturer of Pittsburg, Pa., died in that city January 25, aged sixty-four years. He was associated in the brick business with his brothers Matthew, Robert, Samuel, Thomas and Adam Mawhinney.

Adam Loughbridge, a terra cotta pipe and fire brick manufacturer, died at his home 2242 North Sixth street, Philadelphia, Pa., January 15. He was born seventy years ago at Twenty-third and Race streets. He had large fire clay works at Seventh street and Germantown avenue. A widow survives him.

Wm. B. Davis, contractor and manufacturer of Manchester, Va., has recently purchased fifteen acres of land near that city where he is establishing a modern, up-to-date brick plant, which will be fitted out with modern machinery and appliances throughout. Mr. Davis hopes to have his plant in operation by the time spring opens up.

The American Belting Company of Youngstown, has practically doubled its capacity in the last six months, so that they are now prepared to make about three thousand square feet a day. They say that a large proportion of this is going into the brick and clay plants all over the country. Not a day goes by but that several brick manufacturers ask for prices, and the name of their nearest agent. This speaks well for the quality of the Alpha canvas belting and the results obtained from advertising in such papers as THE CLAY-WORKER.

C. B. Willis of Graniteville, S. C., and C. McLean of East Liverpool, Ohio, are at the head of a company which is to be organized to manufacture pottery at Graniteville, S. C.

At the annual meeting of the Illinois Brick Co., Chicago, Ill., William Schlake and C. B. Vernooy were elected directors to succeed F. B. Alsip and J. H. Gray. The directors elected G. C. Prussing, president, succeeding L. H. Harland.

The plant of the Louisville Fire Brick Works at Louisville, Ky., was badly damaged by fire January 20th, causing a loss of $20,000. The origin of the fire is a mystery. The work of reconstructing the burned portion was commenced the day after the fire and will pushed as rapidly as possible.

At the annual meeting of the Sandy Hill (N. Y.) Brick Co. the following officers were elected for the ensuing year: President, W. J. Gallagher; Vice-President, Patrick Malan; Secretary and General Manager, A. H. Perrigo; Treasurer, B. G. Higley. All the officers named constitute a board of directors.

The Composite Brick Co., New Haven, Conn., has purchased the exclusive right to manufacture in that State composite bricks, and will establish a plant with a capacity for producing 50,000 bricks a day. The officers are: President, William J. Atwater; Edward B. Munson, Treasurer, both of New Haven, Conn.

The Brenham Brick Yards, of Brenham, Texas, are undergoing some extensive improvements, preparatory for the rapid increase in the business of the yards. Among other improvements is the putting in of a dummy line from the clay bank to the brick machine, so the teams will hereafter be replaced with cars, and the work more rapidly and economically accomplished.

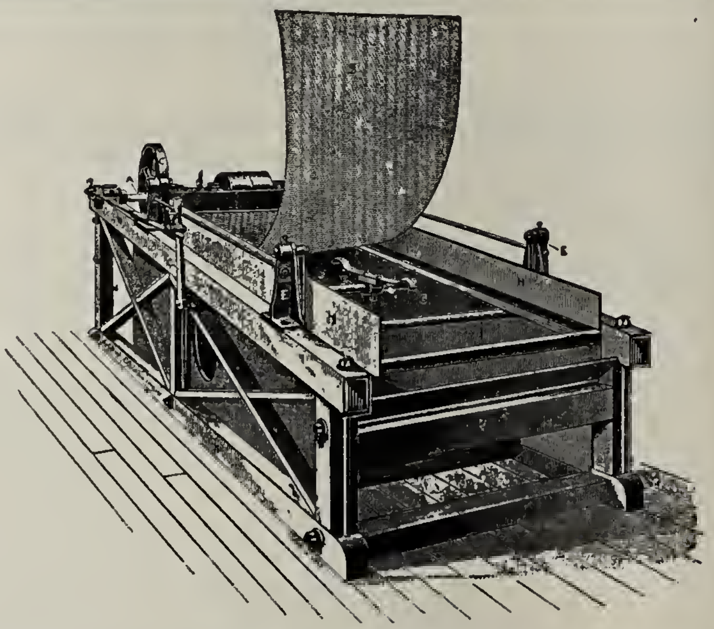
At the annual meeting of the Purington Paving Brick Co., Galesburg, Ill., January 28, the following directors were elected: D. V. Purington, W. S. Purington, George C. Prussing, Robert Mann Woods, W. E. Phillips, C. H. Chamberlain, F. G. Matteson The directors then elected these officers: President, D. V. Purington; Vice-President and General Manager, W. S.

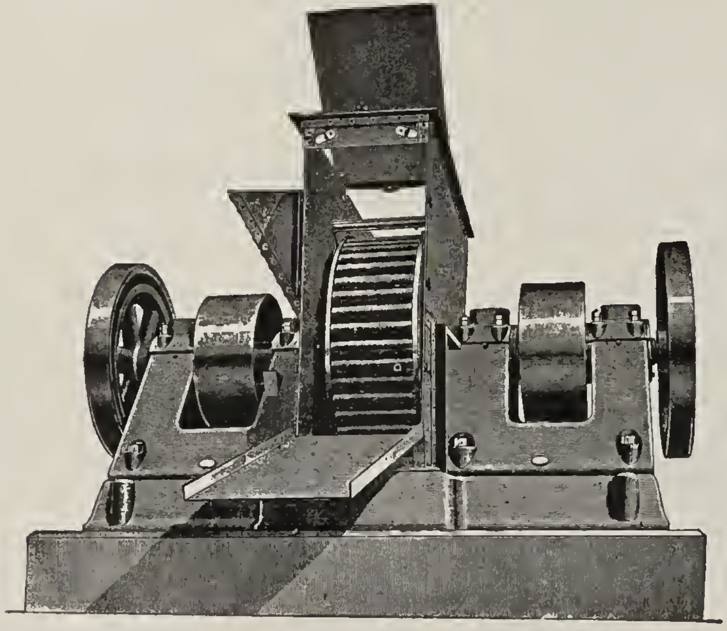
[CONTINUED ON PAGE 294.]

STEDMAN'S AGITATING INCLINE SHAKER SCREEN.

A GOOD Screen for properly screening to any degree of fineness a great variety of materials, and especially clay, is a long felt want. Our Incline Agitating Shaker Screen meets the requirements of the trade in the most successful manner possible.

In this screen we have one of large capacity for small floor space and one that will screen fine without clogging, as the agitating device we have underneath the screen wire prevents any clogging of the screen holes when screening clay or any other material in a dry or semi-dry condition. The screen will run with little power and without any shake or jar to the building, as the moving parts are well balanced by an adjustable counter-weight within the rim of the balance or fly wheel





Stedman's Improved Disintegrator and Pulverizer for Clays.

For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition.

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials.

Stedman Foundry & Machine Works,
AURORA, INDIANA.

Waste Heat Dryers.

RODGERS=THAYER ENGINEERING CO.,
303=305 Dearborn St., Chicago.
SPECIALISTS.

The utilizing of Waste Heat from cooling kilns is beyond question the most economical system for the drying of clay products, but the system must be properly designed to secure the best results.

Mr. L. E. Rodgers, who has been Western manager of The New York Blower Co. for a number of years, has designed the greater portion of Waste Heat Dryers installed in the West, all of which are in successful operation.

This experience may be of service to you either in building your new dryer or remodeling your old one.

Each plant is given individual treatment and we can connect to your down draft, up draft or continuous kilns.

Why not be sure before going ahead, as it costs no more?

Write for our list of references, which includes some of the best among the Brick, Sewer Pipe, Hollow ware and Pottery manufacturers of the country.

OUTFITTERS FOR COMPLETE DRYER EQUIPMENT.

EDITORIAL NOTES AND CLIPPINGS—Continued.

Purington; Secretary, W. H. Terwilliger; Treasurer, C. H. Chamberlain; Sales Manager, F. G. Matteson.

The Kansas City Cement Brick Co. has just been incorporated in Kansas City, Mo., with a capital stock of $50,000.

The Indiana Fire Brick Works at Anderson, Ind., was partly destroyed by fire February 6. The loss is placed at $50,000.

The immense plant of the Pittsburg Terminal Clay Mfg Co., near Elizabeth, Pa., was destroyed by fire recently, entailing a loss of $60,000. The plant will be rebuilt at once.

The Scott Patent Brick Co., Knoxville, Tenn., has purchased a tract of land adjacent to their present property for the purpose of enlarging and increasing the capacity of their plant, which will be almost doubled.

The Beaumont Brick Company of Beaumont, Texas, has closed a contract with the Central Coal and Coke Co. of Neame, La., for 1,000,000 brick to be used in the reconstruction of their plant, which was recently destroyed by fire.

Charles Tuttle, who has been with the Scott Mfg. Co., Keokuk, Iowa, as their erecting engineer, has resigned to go into the brick business in Illinois. Mr. Tuttle says he will install an Andrus machine on his plant.

The Pennsylvania Clay Co. of Matawan, N. J., advise us that they will largely increase their drying capacity, as they have booked such large contracts for spring work that their present drying room is insufficient. The work of extension will be started at once.

Thomas Dennis, a veteran brick manufacturer of Clayton, Conn., died at his home in that city January 18, 1904. Mr. Dennis had been in the brick business in Clayton since 1880. He is survived by his wife, five sons and four daughters. The sons will continue the business.

Persons looking for a bargain in the way of a brick plant are requested to read the ad. of the Fredericktown (Mo.) Brick Co., among the regular "For Sale" ads. They say the plant is worth $10,000, but can be purchased for much less if the deal is closed within the next sixty days.

In renewing his subscription to CLAY-WORKER, M. F. Rusfeldt, Albert Lea, Minn., says he had an exceptionally good season last year, making at his two plants at Albert Lea and Wrenshall, 8,000,000 brick, most of which he has sold, but he is holding some stock for the spring trade. He says the brick manufacturers generally throughout Minnesota had a good year and prospects are bright for a still better one the coming year.

The Wisconsin Brick and Tile Co. has been incorporated at South Germantown, Wis., with $25,000 capital stock, by P. G. Duerwachter, John Flanigan and Edward Tobin. The new company will operate the plant of the old Milwaukee Brick and Tile Co. The plant at South Germantown will be enlarged and equipped with the latest improved machinery so that the output will be greatly increased and of the highest quality.

E. S. Morse, for many years general manager of the C. P. Merwin Brick Co., New Britain, Conn., has retired from the company and has sold his interest in it to R. C. Merwin. Mr. Morse has been in the brick business for a number of years and is well known among the New England brickmakers. The Merwin brickyard is one of the best equipped yards in that section. The officers of the company are: President and General Manager, R. C. Merwin; Treasurer, H. D. Payne; Secretary, George E. Green.

The Standard Fire Brick Co., Pueblo, Colo., has had a fine trade the past season. This enterprise has grown from a small plant until it now has a daily capacity of 80,000 fire brick, 90,000 press brick and 75,000 paving brick. The plant itself is up-to-date in every respect and under the able management of Mr. F. L. Capers, president of the company, it is gaining its present widespread reputation. The world is its market, the company not confining its operations by any means to the borders of the United States, but shipping its products to Australia, South America, Mexico and Canada.

Alfred Yates, for many years manager of the Johnsonburg (Pa) Vitrified Brick Co., is sending out the following announcement to the trade: "On February 1st I severed my connection with the Johnsonburg Vitrified Brick Company, Johnsonburg, Pa., and assumed the general management of the Shawmut Brick Works, Shawmut, Pa. I will soon be in position to fill all orders promptly for paving bricks and blocks equal in every respect to the famous Johnsonburg pavers. Thanking you for past favors, and soliciting a continuance of your patronage, I remain yours respectfully, Alfred Yates."

H. A. Moise, Padilla, Wash., writes that a company is being organized at that place to erect a plant for the manufacture of clay ware.

C. H. Wilkins, 61 Forest avenue, Atlanta, Ga., writes that he is in the market for an equipment for an up-to-date pottery of 5,000 gallons capacity per week.

The Fertile Brick and Tile Co. has been incorporated in Fertile, Minn., with a capital stock of $50,000, by George Kronschnabel, Andrew Opheim, Brown Duckstad and Norman Hanson.

The Nebraska City (Neb.) Paving Brick Co. has been reorganized and will hereafter be known as the Nebraska City Brick Co. Milton McClimans will have the management of the new concern.

Theodore Abrams, president of the Green Hill Fire Brick Co, of North East, Md., was struck by a passenger train at Elkton and instantly killed February 5. Mr. Abrams was on his way to the passenger station to take a train home. He was fifty years old and is survived by a wife and one son.

The McCroskey Mining and Mfg. Co., has been organized at Knoxville, Tenn., and the work has been commenced on a large plant for the manufacture of brick. Mr. T. C. Lundy, for many years superintendent of the Garden City Brick Co., at Farmingdale, Long Island, N. Y., has been engaged as superintendent of the new plant and will have entire charge of the construction of the plant. With Mr. Lundy in charge there can be no question of the success of the new concern, and he has the best wishes of his many friends throughout the country. The other officers of the company are, President, Major E. E. McCroskey; Treasurer, John Horne; Secretary, J. S. Robbins.

In a recent communication the newly elected president of the N. B. M. A., W. S. Purington, vice-president and general manager of the Purington Paving Brick Co., writes that while they are closed down, they are very busy making improvements, including the installation of electric light plants on all of their yards, putting in an immense boiler in place of two small ones and improving their dryers by adding three 108-inch exhaust fans and one 160-inch blower. Their superintendent, Mr. Smith, has been compelled on account of ill health to take a vacation, and Mr. Everett Swett, for some time superintendent of one of the Illinois Brick Co.'s yards at Chicago, has been engaged in his place.

SAWS

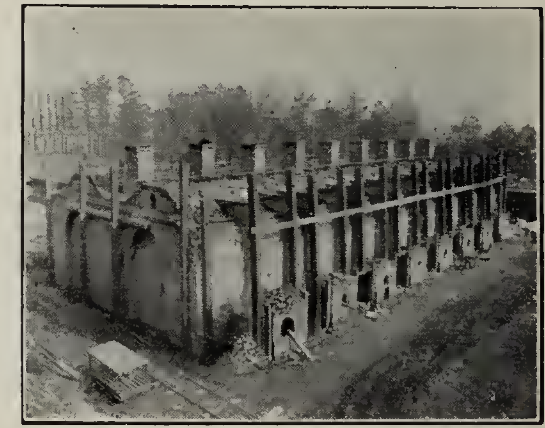
ODD LENGTHS OF RUBBER,
AND GIANT RED STITCHED,

from 2 ft. to 80 ft long, and from 1 in. to 16 in wide; 3, 4, 5, 6 and 8 ply FIRST-CLASS BELTING less than mfrs. cost prices. GET OUR PRICES on Rawhide, Paulins, Tank Pumps, Hose, Injectors, Steam Gauges, Brass Fittings, Lard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Sawing Machines, One-Man Log Saws, Asphalt Felt Roofing, Endless Thresher Belts. One Trial will make you a regular customer of the

MILLER OIL & SUPPLY CO Indianapolis.

Send for Catalogue.

Something New In Kilns.



Dennis's Double Chamber Up and Down Draft Kilns show new features that make them great fuel savers. They are cheap to build and cheap to operate. They have many points of advantage that appeal to practical brickmakers. Full particulars freely given.

F. W. DENNIS, Atlanta, Ga.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XLI. INDIANAPOLIS, IND., MARCH, 1904. NO. 3.

Written for THE CLAY-WORKER.

THE METROPOLIS A GREAT BRICK MARKET.

Greater New York Now Builds Forty Public Schools a Year.

THE CONSUMPTION of building brick at the nation's metropolis, while not so great as in years gone by, before the introduction of steel skeleton skyscrapers, is still very great and ranges anywhere from 25,000,000 to 50,000,000 building brick a week, depending on the season of the year and the influences which control building operation. New York is also a great market for press brick, which are used for the fronts of most of her large buildings. It is estimated that 12,000 pressed brick are used each year, and these are sold at an average price of about $30 per thousand on board the cars.

156th St. Boston Road and Jackson Ave, New York City.
C. B. J. Snyder Arch't

One of New York City's High Schools. Capacity 2,750 pupils.

It would seem as though all the pressed brick factories throughout the Central West as well as those of the Eastern States are drawn on for front brick, and as a result our great buildings present a varied appearance that is very pleasing. All shades and colors from a light gray to a dark red may be seen, but during the past season or two there seems to have been a decided preference for the varying shades of gray. Strolling through most any of the down town streets one will occasionally come on to a striking combination of reds and yellows, and in a few instances it would seem as if the builder had tried to see how many varying colors he could get into a single front.

The first cost of these press brick fronts is rather excessive, but in the long run they are very economical as there is no painting as in frame structures, nor scraping or cleaning, as in stone or marble. The average cost of laying face brick is $45 a thousand, common brick can be laid for $18. There is a constantly increasing demand for enameled brick, a portion of which is still imported from England, but a greater portion of the supply is now furnished by American manufacturers.

The city of New York itself uses each year a vast quantity of brick in the building of public schools and other municipal structures. During 1903 forty new public schools were built, for which more brick were required than is usually needed in a small city. These buildings are not all fire proof, and were constructed of brick with terra cotta trimmings. The aggregate expense was over $5,000,000. The total capacity of these forty schools was 61,500 pupils. New York now has all told some 515 school buildings, with a total seating capacity of 602,000. It is probable that an equal number of school buildings will have to be built each year for at least a decade or more.

The accompanying illustration will give the reader a fair idea of the character of work that the city is doing in this line. The building is known as the Peter Cooper High School. It will accommodate 2,750 pupils, and cost complete, including sanitary, heating and ventilating, furniture and laboratory features, $583,000, making the cost per pupil $219.30. This, local builders claim is but about one-half the pro rata cost of similar buildings in Chicago, Boston and other great cities.

Written for The Clay-Worker.

A BRICK PLANT NEAR THE RAISIN CITY.

Conditions Which the Brickmakers of California Have to Meet.

OIL AS A FUEL AND AS A DUST PREVENTIVE.

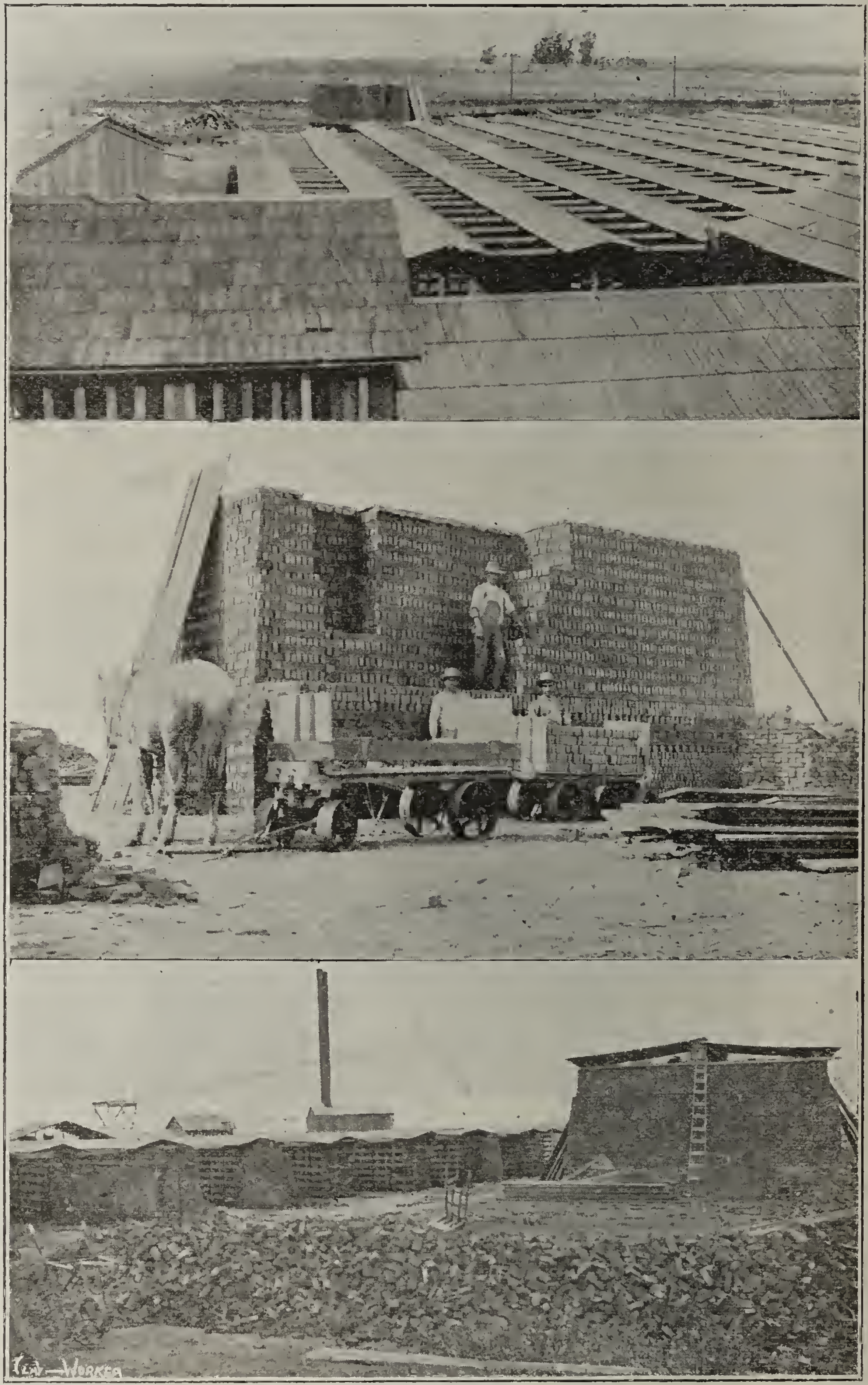
BRICKMAKING is not a pioneer business in new countries. It is frequently the case that primitive factories attempt business prematurely under the impression that the people are ready for the product, only to fail for lack of patronage. The use of clay products presupposes that sufficient wealth has been produced from the soil to more than supply the immediate necessities of those who are converting the wilderness into a habitable country and making cities where only the squirrel or prairie dog held sway. In proof of this general proposition, the writer has seen the marks of brick yards at various points in the San Joaquin Valley, California, where years ago the ancient art of brickmaking was attempted. The only explanation of their disappearance obtainable was "no market, not enough demand for the goods." Under these conditions the brickmakers

"Fold their tents like the Arabs
And as silently steal away."

But times and conditions have changed in this valley. A part of the great plain has been watered by the well-known methods of irrigation. Intensive farming and fruit growing have supplanted the stock range, giving rise to flourishing towns which are ready to use the product of the brickmaker.

The city of Fresno has become a point of interest from the fact that it is in the center of the raisin industry in the State and the place from which immense quantities of packed fruit of various kinds are shipped to all parts of the world. It is also famous for the quality and quantity of its vintage. This growing city, whose population now numbers nearly 20,000, has of late years been demanding brick for their business blocks, using all that two yards can supply.

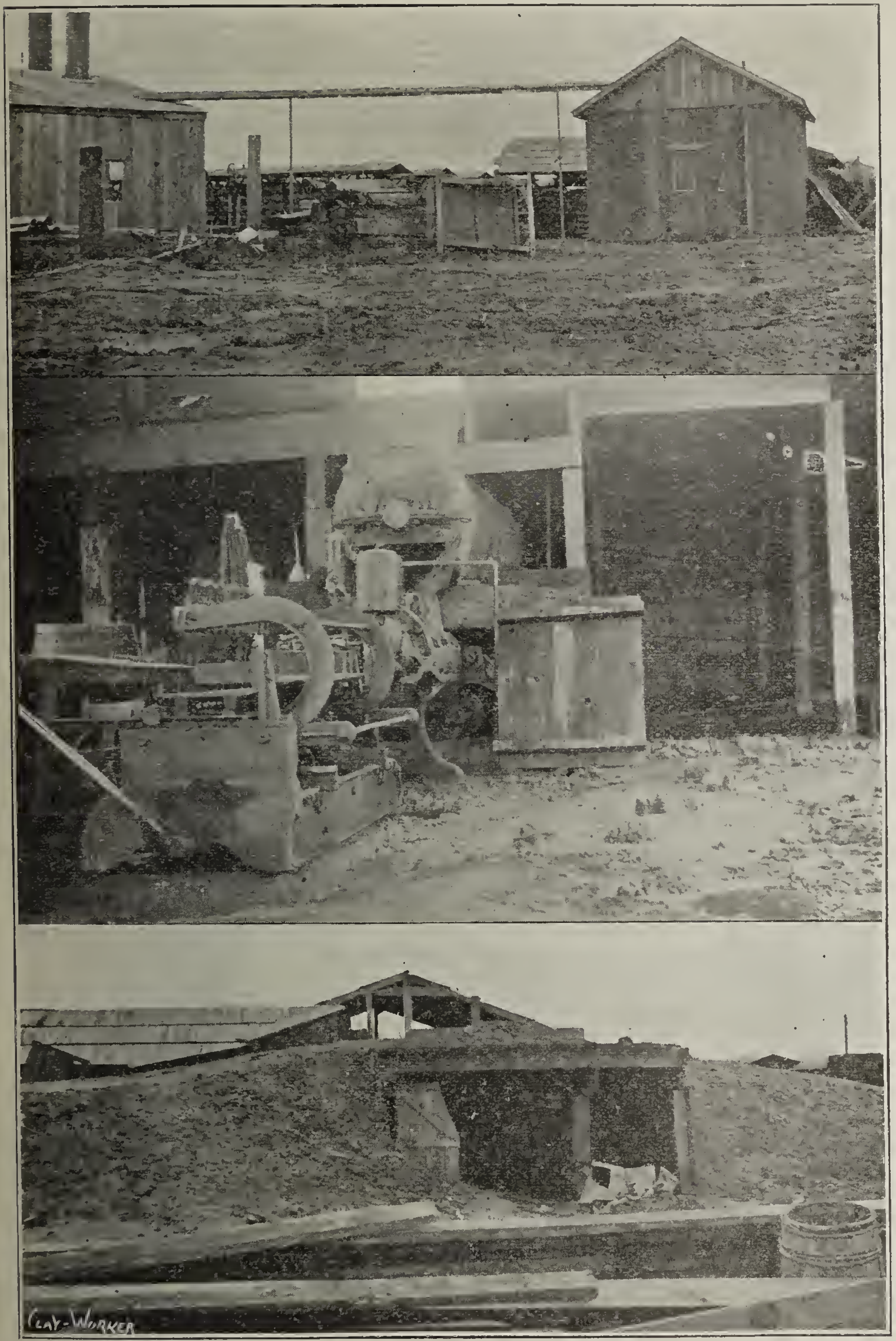
The old Spanish Mission style of architecture is often mentioned as peculiar to the buildings of the southern half of California. While but few distinctly "mission" buildings are now erected, the influence of the style has modified building taste to such a degree that many peculiarities exist which may be easily traced to the early Spanish religious invasion of tropical California. Briefly enumerated these distinctive features are low flat-tiled roofs, short square towers for ornament, and projecting gables and open porticos, the later a part of the main building rather than an addition. It is not uncommon to see brick churches with open vestibules and square topped towers, with other mission characteristics grafted on to a modern building. The result of this blending of several styles of architecture is a remarkable freedom from conventional forms of building as followed farther east, leaving the field open for the exercise of any fancy in the architectural line.



Works of Fresno Brick and Tile Co. (1) Birdseye View of Dryer. (2) Setting a Kiln. (3) Drying Yard and Kiln.

It can not be said that the brick which are made from the desert soil are first-class with respect to hardness or density. The material lacks those mineral constituents which fuse and produce the stonelike stability which marks the superior modern brick. However, in a climate where there is an annual rainfall of only eight inches and but little alternate freezing and thawing, they are satisfactory as to durability and are probably superior to hard brick as a heat resisting building material.

The plant of the Fresno Brick and Tile Co. is located about three miles north of the city at a siding of the Santa Fe Ry., known as Andrews. The company has forty acres of what they consider the best brick clay in that region. It is what is called adobe, that is, it is a stiffer soil than is commonly found in that vicinity. Its placticity is not at all pronounced. No imposing buildings or sheds are required in this climate for all drying is done in open air under low rack sheds. When this little plant began its year's work last March there was not a brick upon the yard. The demand of the preceding year was greater than could be filled, notwithstanding the fact that another factory of good capacity had been at work steadily.



Works of Fresno Brick and Tile Co. (1) Boiler and Engine House. (2) Raymond No. 2 Stiff Clay Brick Machine. (3) Clay Dump at Machine.

The fuel used for firing the boilers and for burning the brick is the California oil which is shipped direct to the yard and run into a reservoir tank sunk flush with the surface of the ground. The tank cars in which shipments are made each hold 9,200 gallons and the storage tank holds two car loads of oil. It should be observed in this connection that the introduction of natural oil has produced a radical change in the fuel problem in Southern California. Factories and mills requiring steam power use oil for fuel. Locomotives are equipped with oil burning devices, and the gas engine furnished with a generator for the use of crude oil is a favorite motor power throughout the State. The oil in car lots costs this factory at present sixty-one cents per barrel of forty two gallons delivered at the yard, and Mr. E. Riggins, the affable superintendent, says that at this price it costs him $1.25 per thousand to burn the brick. The equipment for burning consists of an oil supply pipe and pump to which is added a steam pipe and tips for spraying the oil as it burns. The tips enter the kilns at the arches, the quantity of both oil and steam being regulated by proper valves. The kiln when ready to fire contains about 400,000 and is fitted with thirty-five tips. Surprising as it may seem the steam from a 40-horsepower boiler is required to spray the oil. The plant has two boilers with a combined capacity of 75 horse-power. A 50-horsepower engine drives a Raymond No. 2 stiff-mud brick machine of 30,000 capacity in ten hours. As may be seen by the illustrations, the buildings are inexpensive and somewhat temporary in character. The clay is delivered upon a dump by two-wheeled scrapers at a cost of six dollars a day. It is fed to the pug mill from the dump by two men who simply push it through a trap into the hopper of the mill below. Four off-bearers with trucks wheel the product to racks seven tiers high, with forty-four bricks on each tier. The time required for drying is only three days in midsummer, but in early spring seven days are often required to fit the bricks for the kiln. The small percentage of moisture in the atmosphere greatly facilitates the drying process, in fact it is sometimes so rapid that the space between the racks is covered with canvas to check the evaporation from the green bricks and so prevent them from cracking. Seven days are required for burning a kiln. The burner has no labor in feeding the fires with wood or coal, or in raking out ashes, but skill and close attention are required in regulating the supply of oil and steam and maintaining the proper heat throughout the kiln.

Very good results are obtained here without expensive sheds, patent dryers or costly kilns. The product is shipped to the city by rail or hauled by teams over an oiled road, a portion of which has been improved and cared for by the brick company.

When seen by the writer last spring the mountains in plain view were still white with snow, while the golden poppy, the State flower, bloomed profusely on every hand. The distant mountains by reason of their immensity seemed scarcely farther away than the spires of the near by city. The brick plant was but a dot on the landscape. As a factor in the building of the town, however, it occupies no insignificant place. While it is true that the ornamental and high class brick are shipped in from abroad, the mass of the walls of Fresno are home brick. The price at which they are furnished, from $7 to $8 per thousand, gives home production a monopoly of the business. A few of the old adobe houses, so common in some arid sections, still exist to attest the value of sun-dried brick in this climate. The five million annual output of this factory is not one-half of the quantity used in the city. The labor problem gives the company some concern, because of the distance of the factory from town. Laborers do not like to live three miles from their work, especially when that work is in the country. Factories of this kind nearly always have difficulty in keeping a supply of competent help so that there is always a temptation to move the plants near to town and ship the clay to them when necessary. This may be done at Fresno when the contemplated enlargement of the plant is made. C. G. E.

Written for The Clay-Worker.

BUTTON-HOLE TALKS.

WE HAD BEEN sitting out on the gallery, the Major, Tom and I, and I had fallen into a brown study as I watched a passing ship, wondering what she was, where she was from, whither going and with what laden. An idle curiosity, never to be gratified, yet always recurring.

From the further side of the field came the cheerful calling of Bob White, and Tom grew restive and showed symptoms of getting his gun, whereat the Major drew him toward him and said, "Not now, Tom. Leave the old boy in peace. He has troubles enough without your going against him. From the moment when he breaks the shell and takes his first look at the sunlight, he is taught that hand, or beak, or tooth, or claw are all against him. No living thing is more harmless than your poor little Bob White, and yet his life must be spent in constant fear and trembling. In his every movement and every act, he must watch out for enemies, and on every hand, for serpent and for sharp toothed four footed raiders whose sharp noses can track him and search him out, for hawks and eagles with sharp eyes and hungry craws, to swoop down from above, and worst of all, from man, great, noble man, who brings his intellect to bear against this little timid bit of terrified flesh and feathers, and trains the dog to hunt him out and show him where he is, and then mangles him with burning powder and hurtling shot as he tries, madly terrified, to escape.

"You don't take all this pains to hunt the Jay! He is not so innocent, indeed he is a born brigand and assassin, and he makes more noise and is much more noticeable. I suppose its because its the custom and because the poor unlucky Bob White carries a mouthful or two of good eating under his feathers.

"But, Tom, let's go hungry this once and let the old fellow keep his 'good eating' under his feathers, and get whatever good he can out of life, for he has made me reminiscent.

"A few years ago I was a good deal like your quail, only I did not have the 'good eating' under my feathers, and I didn't sing his cheerful call. Indeed, I wasn't singing at all just then. One thing after another had gone wrong with 'yours truly' and a climax seemed at hand. I hadn't done any more wrong than the poor hunted quail had, and yet it seemed that the hand of every man was against me. At any rate there wasn't any hand *for* me. All I could do was to struggle on, one weary wearing day after another, fighting off, and going just as your Bob White does, afraid of every shadow, and properly distrusting it, too.

"Bob White doesn't have just himself to look out for you know, for he has to look out for a big family and that's where I was like him, too. There were times, too, my boy, when I felt as he must, that if it wasn't for the chickens, *and the hen,* I would just crawl off and lay down and let some of them eat me.

"I suppose 'Bob White' must sometimes sit down in a quiet place and try to think it out, and wonder what he has done that he must be the most hunted creature on the footstool, anyway I know that 'your servant' did so on many occasions and he never could get the right answer.

"He saw men that he knew were unworthy, that were welcomed by worthy men, and to whom assistance was hurrying on every side, and he inventoried his own prospects, and again he came to his utter helplessness and absence of anyone on whom he could depend for aid. He saw again the loved ones who depended on him and who were entitled to look to him for tender care. He thought of all those who seemed but hunting him and who would hunt them, and he almost doubted his God.

"But note this my boy. He didn't give up and go hide. He fought his fight day by day as well as he knew how and finally the aid came. Sometimes the clouds stay over the sky for a long time, but the sun comes sooner or later and when it does come after such a spell it looks very bright.

"My enjoyment of the sunshine, after all the dreary awful siege I had, is so great that I want to let every poor hunted thing live and have happiness and enjoyment, even as 'your uncle,' who was one of them—one of the hunted—is having happiness."

Gates.

Written for The Clay-Worker.

CLAY INDUSTRY IN CUBA.

IT IS QUITE some time since I sent you a communication regarding conditions in the clay industry in Havana and vicinity, and a little news from here may be interesting at the present moment, as there is a great chance to do much business in the near future.

In addition to securing the $35,000,000 loan for the payment of the Army of Liberation, a further loan of $28,000,000 has been successfully negotiated by the city of Havana, to be applied to sewering and paving the streets. The bricks are to be as good as those used in the United States for similar purposes, and as there are none but adobe bricks made here now, and no existing plant which has the right material, it looks very much like large orders being placed in the States. But on the other hand, there is at La Trampa, about 15 miles out, a very large bed of shale of the finest quality, free from lime and a bank of excellent sand, also. The railroad is about three miles distant, which would, of course, be a serious detriment in the States, but of little account here in this case, as there would be no competition owing to there being no other known shale bed. This seems to me to be a good opportunity for some enterprising brick manufacturer to make a good investment, and certainly is worth investigation.

The Palatino and the Vento yards, both American, are shut down and are for sale. The former plant has a very good claybank, and with the addition of a wet-pan to its present outfit, could in my opinion be made very successful. The clay contains a rather large percentage of lime in small lumps, which if crushed and distributed by a wet pan would be rather beneficial than otherwise. Everything else needed is on the plant, including the regular 777 Raymond outfit. A very good building brick can be made on this plant. The Vento plant is practically out of the running.

The other yards, all adobe, are running full time, their product selling for $16 a thousand, but cannot supply the demand, in consequence of which, a large number of American bricks are being imported.

There will be a great amount of American capital invested here this year. Most of the visitors to the island this winter have brought money with them and a full intention to invest it. There have been few regular tourists, and yet the hotels and boarding houses have been crowded to their fullest capacity. Probably the cold winter in the States has had something to do with the exodus, and once on this delightful island, one feels very strongly tempted to stay, and often does.

The demand for French Roofing tile is as strong as ever, and France and Spain supply it. Prices are $65 to $70 per thousand, so one can readily see here another good opportunity for a profitable investment. The island is tranquil, its government stable and safe, and I do not understand why American investors do not see the possibilities and seize the chance. But things come slowly at first, and one must wait for them.

Havana, Cuba. J. Mair Stavely.

SAND-LIME BRICKS.

ONE OF THE most interesting features of the brick manufacturing business during the past year, is the remarkable development of the sand-lime brick industry. Only a few years ago the claims made by the originators of the process in this country were received with incredulity. It has, however, taken but a short time to demonstrate that a most excellent building material can be produced from sand and a small percentage of lime and in only twelve hours' time.

The time is past for neglecting this important factor in the structural market. Numerous important public and private buildings throughout the country have been built from these bricks and not only present a handsome and substantial exterior, but recent experiments have shown that the bricks are growing harder and stronger with time. The absorption is much less than the average clay brick, and the architect has the advantage of securing striking color effects not possible in clay products. The natural color of the sand-lime brick is a softly tinted gray or granite. By the use of lime-proof pigments in the manufacture any desired color may be obtained. The quality of the bricks depends largely upon the material used and the proper process of production. These bricks are being successfully used for pavements, and are just as adaptable for sewer or firebrick use. United States Government experts have tested the material and declared in favor of the "Huennekes System" sand-lime bricks, in direct competition with clay brick.

Works of the Ventnor Concrete Co.'s Sand-Lime Brick Plant, Atlantic City, N. J.

We publish herewith cut of the Ventnor Concrete Company's plant at Atlantic City, N. J. We quote from a recent letter from them as follows:

"These works were originally erected at great cost for the manufacture of sand cement, cement brick and artificial stone made from cement. We were unable to market any considerable quantity of the cement products, owing to the high cost of manufacture and the general criticism of the cement brick. Architects and contractors generally condemned them on account of their high absorbing qualities and liability to weather stain. On the other hand our sand-lime brick is meeting with the greatest favor from builders and architects. At this time we are furnishing a half million of brick to the new Carnegie Library Building. We have without causing any unnecessary expenditures or changing the machinery materially, added the necessary features for the installation of the 'Huennekes System' and the factory is now turning out about 15,000 bricks on each press on a ten hours' run."

A prominent engineering magazine recently published an article on the adaptability of the sand-lime brick for paving purposes. This article was accompanied by two cuts of pavements in Sioux Falls, S. D., laid with "Huennekes System" bricks. It is stated that these pavements after going through an unusually severe winter in that climate, and after more than one year of constant use, show no signs whatever of disintegration, and are seemingly harder and more firm now than when laid.

Three different fire tests recently made showed a fire resistance of 2,800 degrees, 3,000 degrees and 5,000 degrees. It is claimed on good authority that bricks produced under this system in the United States with reference to fire resistance are far ahead of a good quality of fire brick.

Numerous unsuccessful experimental processes and so-called "systems have been exploited in this country for the manufacture of sand-lime bricks. In viewing this enterprise from a business standpoint, however, it appears good policy to base our opinions on actual results. The H. Huennekes Company of 114-118 Liberty street, New York, are the only firm in this line who have made and are making a thorough commercial success of the business. They state that they have built during the past year upwards of twenty factories of different capacities, with nearly as many more under construction and contemplated. Their remarkable success in so short a time is due to their long experience, perfect equipment, and the "Huennekes System," which is not based on theories alone, but on practical ideas which have fully demonstrated the superiority of the product.

We predict even greater activity in this industry during the current year than we have witnessed in the last, and would urge American brick manufacturers to heartier co-operation with the sand-lime brick interests. F. H.

For desirable situations read the Clay-Worker "Want" ads.

Written for The Clay-Worker.

FROM EASTERN MAINE.

Big Bed of Potter's Clay Discovered Near Bangor—Brickmakers May Burn with Peat Fuel.

FUEL IS THE PROBLEM to next create serious thought in the minds of New England brickmakers. I've said something like this before, but it seems to me that wood is disappearing much faster than even the most foresighted of us could see. Maine will have a log cabin to represent its resources at the St. Louis fair, and it will be about as representative of Maine as the wolf-dog on the national emblem of Ireland. It is centuries since there was a wolf or perhaps a wolf-dog in Ireland but the wolf-dog still remains on the emblem. It will give the visitor at the Fair the impression that Maine is still what she was fifty years ago, the lumber supply of the country and the paradise of the hunter. It is a false and unfitting representation.

Maine is no longer a great exporter of lumber. She has still fish and game, but she has other things vastly richer and vastly more interesting. She has the finest granite and the greatest variety of granite and other building stones in the world. She has the best red brick clay and some of the best brickmakers in the world. She has shipping and some of the finest sailormen on the sea. She has iron ore in abundance and iron mills, woolen and cotton mills, shoe factories and paper mills, either one of which speaks more clearly of her progress and civilization than the finest log hut that was ever designed. She has paper mills and pulp mills, and these it is that are rendering her unfit longer to be represented by a log cabin.

Her forests are going as by the blast of a conflagration. Thousands of acres of wooded hills and vales are at this moment being denuded to feed the insatiable man of the pulp mill, and where the pulp mills' axeman goes no growth is left to give cutting for another generation. The Maine woods and the Maine game lands are doomed. So surely as its hemlock wilderness disappeared, years earlier than her experts had figured they would begin to show signs of exhaustion, so will the woods of Maine pass into paper, and the log cabin and the moose become as emblematic as the Irish wolf hound and the Welsh lion.

And the brick burner feels it now. Wood is more difficult to find every year. It is not far away in the future when coal or some other fuel must come in, for brick will be burned in Maine so long as its clay banks sit upon the earth and the sun shines down upon them.

Will it be coal or peat? I am inclined to think that it will be peat. We have peat bogs as inexhaustible as our forests were said to be and we have just awakened to the necessity of turning them to account. The first peat manufacturing plant will be in operation near Bangor in the spring and they propose to compete with both coal and wood dealers in the Bangor market. They claim now that they can undersell the coal man and make a profit.

And speaking of wood and peat. Sam Holyoke, the Brewer brick manufacturer, told me of a queer experience he had a few winters ago. He bought 200 acres of forest near Lake Chemo, ten miles from his place, and cut about 300 cords of wood, yarding out in a flat clearing, not far from the edge of the lake, to season. It was winter time, and the earth was frozen solidly, and Sam left his wood to return for it the next winter. As soon as snow came the following winter, he sent his teams to haul in the seasoned wood. They reached the spot where he had piled it, but could find no trace of it, not a stick. Here was a mystery. It was made plain that the wood could not have been hauled away, but it was thought that fire during the summer had destroyed it. The theory, however, was exploded by the first thaw, which disclosed a clear pond of water on the spot where the wood had been piled. Further investigation revealed the fact that the wood was still in its original piles on the very spot where it had been placed, but had sunk to a depth of ten feet in the yielding peat. It is still there and will be a curiosity to some peat manufacturer a few centuries from now digging peat at Chemo.

Mr. Holyoke is undecided whether or not to abandon the brick business. He has been a manufacturer for 30 years, succeeding his father, Joseph Holyoke, one of the pioneer brickmakers of Maine. Mr. Holyoke never deviated far from the methods of his father. He made excellent brick and burned them well and handled his business generally in a conservative manner. No union had ever invaded Brewer and so far as his business was concerned unions were unknown to him. He is a believer in unions to a certain extent, but when last summer the union men refused to lay his brick because his teamsters were not union men, he thought unionism had reached the limit of endurance. Mr. Holyoke is an American, thoroughly imbued with the spirit of American liberty and fair dealing, and the actions of the unions and the result, coming so unexpectedly, was a shock to his faith in the everlasting principles of the Republic and their efficacy in these days.

At the beginning of this new year the supply of brick for early demand was short nearly to extinction. However, the brickmakers believe they can supply all that the market calls for. Prices will range high at the opening.

The firm of John Grady & Son, contractors of Bangor, are figuring on some big jobs in brick building, to be erected in various parts of Eastern Maine. Among these plans are some for the erection of several large houses of concrete, concrete and brick, and concrete and wood. A notion gains currency here that cement concrete is cheaper building material than brick, and nearly, if not quite as cheap as lumber at $12.00 to $15.00 per thousand. No figures have been forthcoming to show comparisons, but I will venture the assertion that when Maine bricklayers learn to lay brick rapidly, as they do in the West, and do it as cheaply, the brick house will beat any house that may be built for the same money. The trouble with brick as a building material is that brickmakers and even contractors are not fully alive to its advantages.

Horace Purinton, Waterville, has just completed a splendid five story brick office building in Waterville. It is the largest in area of any modern building east of Portland and is of beautiful design. The front is of gray brick.

One of the unexpected events is the discovery of potters' clay within three or four miles of Bangor. Dr. H. F. Hanson is the lucky man. The doctor owns a hill known as Hermon Hill, which is composed of stone, commonly and incorrectly called black granite. It is not granite, but a hard black stone with ray markings, and colorings resembling in shape and effect the "eyes" in birdseye maple. It is the most beautiful stone for wainscoting, pillars, etc., ever discovered. It is the only thing of its kind known. I have forgotten its name, but I understand that you are to have a thorough description of it from one of my Bangor friends, Mrs. Flora Haines, an authority on ceramics and many things.

Well, the doctor in exploring his hill of rare stone, ran across and gathered in one day some twenty dollars worth of pure gold, twenty-five dollars worth of platinum, and more or less of various other minerals. Now being something of a mineralogist the doctor gazed over the immense peat bog at the base of the hill, or mine as it may be called, and began to reason that the wash of years from his hill should have produced siliceous earth somewhere. He dug into the bog and found it, under five feet of fuel peat, a bed of clay laying from five to sixteen feet in depth over an area of more than 25 acres. This clay contains over 65 per cent of silica and some fourteen per cent of alumina with peroxide of iron of more than ordinary percentage. Sample jars and pots have been made from the clay, which burns at some degrees a rich maroon color, changing with added degrees of heat into many darker, and equally rich shades.

The discovery has set geologists at work here. Heretofore potters' clay was among the list of good things which the Creator was supposed to have denied to Maine. Prof. Ora W. Knight of

Bangor, chemist and lately in University of Maine, has no doubt of this being potters clay. He also believes that precious metals will yet be found in paying quantities in this vicinity.

B. J. DUNN.

Written for THE CLAY-WORKER.

MAKING BRICK FOR UNCLE SAM.

One of the Largest Brick Plants Near Washington.

PROGRESS means change, and as Mr. Theodore L. Holbrook, president of the Standard Brick Company and also of the New Washington Brick Company, is one of the most progressive men in the brick business in this section it is not at all surprising that he had in mind some time ago the adoption of the water route idea, but this has not yet materialized. The New Washington company's plant is the largest of all those which are situated in Virginia and contribute to structural Washington, and it is possible will be first to abandon the wagon road haul for the river route, when this method is adopted by the Brick Haven people.

There is good clay in abundance in that neighborhood and the surrounding country, and millions of brick are turned out annually by the factories situated there. As mentioned, the New Washington Brick Company's plant is the largest of these and this perhaps deserves a more extensive mention than has been given it in previous news letters.

In the Machine House of the New Washington Brick Company's Plant.

The plant in question is not only the largest of the group spoken of, but it is possible there is not a larger south of New York. The landed area of this company comprises about 216 acres of excellent soil, pretty much all clay; it once belonged to a property of 3000 acres, and belonged to the Park Custis estate, on which (the brick plant property) still stands the old Park Custis mansion. Some hundreds of yards from this the brick factory rumbles and puffs away, in great contrast in its excellent modern outfit, to the method of brickmaking used when the old mansion was new and its master "live clay."

The machinery plant is well walled and covered. The machinery itself is up-to-date and always in working order. It consists in main part of two Graham brick machines of 113,000 aggregate daily capacity, and six re-presses and the power engine operated by two 100 horsepower boilers. Other equipment consists in part of an electric plant for lighting purposes, machine shop and blacksmith and wheelwright shop, everything necessary for making repairs, etc.

The clay used comes from a deep cut of fine material and is hauled to one end of the factory and emptied into the pit in which is the spiral cutting machine. Being welted and macerated the clay goes by a belt carrier, which runs aloft, to the second story and there delivers its freight to two other carriers of the same nature, each taking a portion of the clay, in opposite directions, to spiral cutters. One of the latter, of course, is arranged over each of the brick machines, and from it the wet clay passes on to the brick molds on the press wheel. Waste clay is carried back to the starting point also by a belt carrier.

The now brick (generally red repress) are taken by belt carriers to the represses and thence by cars to a main track from which runs other tracks connecting with the dryer system The dryer is composed of brick with a sheet iron covering, holds 226,000 brick is heated by direct heat from coal furnaces. Brick are run into the dryer by means of wire cables attached to a string of cars (each car holding 550 brick) and operated by a winding-up, wrench method. Brick are also taken into the kilns by rail track. The kilns are six in number having aggregate capacity for 3,150-000 brick. They (the kilns) are built in line so that only three covers are necessary; these are moved upon wheels, the shed being thus easily and quickly taken from a kiln when the stage of burning requires removal of cover.

A Glimpse of the New Washington Brick Company's Plant.

In the matter of water the factory is well looked after. An artesian well 140 feet deep, supplies demand in this direction, the water being pumped into two tanks each of which holds 22,000 gallons.

At the Clay Bank of the New Washington Brick Company.

It requires not a little man-help—and mule help, too,—to assist in carrying on the work of this big brick factory; the workers, including team drivers, are about two hundred in number. There is something of a village aspect about the surroundings of the New Washington Company's plant, for here are seen over twenty houses built by the company and rented by the employes. The brick company also owns a store located not far from the factory office, at which the men buy various things. But no factory hand is compelled to trade at this store—he can spend his money elsewhere if he so chooses, and sometimes he thus chooses.

The New Washington Brick Company's negro factory hand seems well cared for; he has cheap rent—$1.50 per week for his house—wages are good, and work in season is continuous. And when it comes to driving a cart or wagon the darkies fits the mule and the mule fits the darkies. I'll bet that when Noah and his family came out of the Ark, Ham was the first fellow to get a ride, and that his mount was a mule.

Both the negro and the mule are well represented at the New Washington Brick Co. The mules are about 125 in number, and are well kept. They have large stables, and there are on the plant property huge barns containing hay, clover, etc., for mule food. The rich land of the place yields prolific crops of grass and clover, and so some expense items are cut out by means of home product.

The landed property and factory of the New Washington Brick Company represent considerable money, about $450,000 it is said, the value of the brick plant being estimated at about $250,000. At the rate of 113,000 bricks a day (considered a days work at this factory) a month's work, not including Sundays, would mean 2,712,000 brick, and the New Washington Brick factory may be called a big thing in the brick line.

Written for The Clay-Worker.

THE FACTORY PRACTICE OF A LARGE GERMAN TILE AND REFRACTORY CONCERN.

THE WORK of a Clay-Worker representative is always interesting, but in a foreign land where conditions and factory practice differ so widely from our own, the interest becomes a fascination. At Schwandorf, moreover, the task was peculiarly pleasant from the fact that the manager, who speaks English, and also the technical manager, were very kind and painstaking in showing and explaining for the benefit of The Clay-Worker, the workings of these factories and the manufacture of a variety of clay products. The technical manager was also kind enough to prepare an account of the history and extent of their operations—the essentials of which are quoted below and followed by some personal observations of your representative.

The clay works of Schwandorf had its beginning nearly 100 years ago, in a hand brick yard. Its first large extension took place in 1867. There are many tile roofs dating from that time which are still perfect and give the best proof of the quality of its products. In the year of 1889 the concern became a stock company, which acquired, in addition to the clay pits already in operation, much other clay land, so that the area of the land occupied to-day comprises about three million square meters. At present, clay and refractory sand are mined in ten parishes of the Upper Palatinate and also in Bohemia. These raw materials are worked with the best machines in two factories at Schwandorf, which is the center of the undertaking, as well as in factories at Wiesan and Pirkensee. The establishment employs more than one thousand persons. Its annual production reaches the following figures:

Refractory products	15,000 tons (ton—2200 lbs.)
Stoneware, pipes and troughs	10,000
Roofing tiles	15,000
Floor tiles	5,000
Face brick and stacks radials	5,000

Especial attention has been paid of late to the manufacture of floor tiles, and this branch is to be extended. The tiles ring like steel, are thoroughly vitrified and non-absorptive. Consequently oil cannot adhere to the tile. Especially fine work is being done in Pompeiian red tiles. This is a specialty and the tiles are exported.

The clay works of Schwandorf is one of the most important and many sided undertakings of its branch. It has brought great benefit to the Bavarian Upper Palatinate, where there was formerly a scarcity of work, and to-day it exerts considerable influence upon the prosperity of the population.

This letter from the technical manager embodies all the essential facts regarding the establishment, but The Clay-Worker representative cannot refrain from adding some of his observations—features interesting to him though commonplace to those who are accustomed to the practice.

In the first place the raw materials are always interesting, and in this case the long rows of clay sheds contained subjects for much more extended study than time would admit of. Kaolin and plastic fire clay for the refractories,—the kaolin also finds application in the white tiles—red burning clay for the roofing tiles, and a variety of other clay from which the numerous color effects necessary for a large assortment of floor tiles can be produced, are stored here in quantity. The pride of the factory, however, is a certain red burning clay which takes on a color tone of rare quality. The manager says that this color cannot be duplicated in Germany for the reason that such clay is not found in other parts of the country. It was further explained that most red-burning clays contain too much iron, and in burning to vitrification become spotted with black blotches. This clay itself is found in two qualities—that lying nearest the surface of the ground being inferior to that lying deeper and containing less iron.

In the preparation of the clay for the roofing tiles, there are two features to which the American observer is not thoroughly accustomed. In the first place, the clay goes through a jaw crusher before the dry pan takes charge of it. Not that the raw material used in this factory is particularly hard to reduce, but because a crusher is the most economical lump breaker and the dry pan's natural function is comparatively fine grinding. This is a point which very many American manufacturers overlook. The writer has vivid recollections of sledging huge lumps of hard clay down to the size of a man's head and then dumping them into a dry pan. How that old dry pan did work! It was a good and faithful pan, yet the cry of the plant was for more clay. There was much talk as to what could be done; the pan had been speeded up to its best capacity and we feeders were instructed to maul it finer, but no one seemed to feel that an important feature of the equipment of the plant had been omitted—utterly neglected! But this is a digression. At Schwandorf the clay enters the pan comparatively fine and the mullers have but one thing to do—hug the bottom and make it interesting for a steady stream of this small fry. The ground clay from the pan is tempered in a Thon Schneider, or vertical mixer. A further mixture with sand is made by running the tempered plastic clay with the sand through rolls. The use of rolls is observed to be more common in German than in American practice, both for plastic preparation and dry grinding. At Schwandorf, however, the function of the rolls is mixing and the manager says they serve the purpose admirably.

From the rolls the plastic tile mixture goes to auger machines. The square horizontal column of clay emerging from the machine, is cut lengthwise into their slabs by stationary vertical wires. The column of slabs is cut by hand into the lengths required and the slabs are ready for the press.

The presses for the interlocking tiles are of the revolver type—a slab being placed in the mold on one side of the press, one step taking it under the press and the next carry it within reach of the off-bearer on the other side. Each press has a capacity of five hundred tiles per hour, so that with two presses the capacity of the plant is two thousand interlocking tiles per day.

Besides these presses, there is an auger machine for conduits, another for "beaver tail" tile and other machines for special work. Some small orders of special shapes are made by hand, but this practice is not carried on to any considerable extent.

The drying process is very much the same all over Germany—rack and pallet system, with no artificial heat in summer excepting what is radiated by the kilns, which are invariably inside the buildings. This naturally makes the drying a slow operation and necessitates a large factory building several stories high. On the other hand the quantity of fuel required is a minimum and there is no loss of ware from drying cracks. The feature of this particular factory's practice is an excellent elevator and conveyor system to and from the drying racks.

The floor and wall tiles previously mentioned, are made by the dry press process. The grinding is done wet in ball mills. Five hydraulic presses, each with a daily capacity of 2,000 pieces, do the work in this department. The most striking thing about the product, aside from the variety of colors, is the great number of artistic shapes and the predominence of curves rather than corners. One cannot help admiring the graceful and artistic effects produced in this way, and the only regret is that no sketches were made to use in connection with this article.

A considerable quantity of refractory products, largely shapes for the steel and iron industry, are made from the kaolin previously mentioned. A good deal of this stuff, notably tuyers, can be made on the auger machines, but the greater part is hand work.

Perhaps the part of this factory practice which is most to be emphasized and yet the easiest to overlook, is the burning. When one considers what a variety of products are made here and what different conditions must be attained in the same continuous kiln, it gradually dawns upon him that this part of the work must require the most extreme care from a skillful kiln manipulator. And the manager fully agreed with this opinion. He says that in order to reach an average of 75 per cent perfect floor tiles, requires a most careful study of all the conditions, even to the direction of the wind—though the kilns are indoors. The kilns are gas fired, both stone coal and lignits being used in the producers, in proportion varying with the kiln conditions required. They use segur cones, too, for the observations of the technical manager. The master burner, however, will have nothing to do with them and prefers to trust to his eye exclusively. It seems that human nature is much the same in Germany as in America. The tendency toward the use of all the scientific aids to practice is also universal and is growing in geometric proportion. The master burner must become a scientific man in the broader sense or the scientific man will have to become the master burner.

NEOPHYTE.

THE CARE AND ENTERTAINMENT OF CHILDREN AT THE WORLD'S FAIR.

THE MODEL PLAYGROUND in the model street at the World's Fair will be a boon to weary mothers and a haven for tired children.

After the family has traversed the aisles in some of the big exhibit palaces, and the parents are eager for more sights, the little ones who have become weary, will long for their play ground and rest places. It was for such as these that the model play ground was designed.

It is situated on the northern edge of the main picture; near one of the main exposition entrances, and within a short distance from the Pike. The grounds are 250x175 feet in extent, and contain everything that will entertain and delight the children. The playground will be in charge of competent attendants. Children may be left and the parent may pursue their sight seeing, knowing that the child is being cared for as well as though he were in his nursery or play ground at home.

There is a big rest place, a room 50x75 feet, equipped with kindergarten paraphernalia, with competent teachers in charge. Near by is a garden where the child may be supplied with spade, rake or hoe and dig in the ground to his heart's content. There are swings for girls and boys and longs rows of hammocks, with the ground beneath them covered with sand, the same as on the sea shore.

There are two great sand boxes, with an inexhaustible supply of sand, and all kinds of moulds to produce images of all kinds and implements to excavate fabulous tunnels.

Then there is an out-door gymnasium equipped with flying rings, ladders, horizontal bars, horizontal and perpendicular ladders, sliding poles, etc., for boys who have a taste for the strenuous.

The bath house on the warm summer days will be a place eagerly sought and the builders of the model play ground have built and equipped one of generous proportions, which will be in charge of trained maids and when the parents call for their little one, he will be turned over to them with hands clean, his face shinin~ and his clothing just as neat as it was when he entered, for while he was at play he will wear a uniform supplied at the office.

The office is of staff, like many of the Exposition structures. The other departments are substantial frame structures with tops of canvas, so that they may be raised or lowered at will. They will be gaily decorated with the flags of all nations, and the entire grounds laid out with pretty gardens of bright flowers and spacious lawns, and the dreaded legend "keep off the grass" will not be in evidence.

The model play ground was planned and is to be conducted under the superintendency of Mrs. Ruth Ashly Hirshfield of New York.

MODERN METHODS OF DRYING CLAYWARE.

THE USE OF WASTE HEAT from cooling kilns in drying clayware, while not a new thing, is a modern innovation and has proven a very efficient and economical process. The method seems adaptable to all manner of plants, though in some instances a deal of ingenuity and mechanical skill is required in installing this system to insure the most effective service. For this reason those who contemplate the waste heat system will be interested in the announcement that Mr. L. E. Rodgers of Chicago, who, though a comparatively young man, is a veteran in this work, has taken unto himself a partner, Mr. Harry W. Thayer, a well-known business man of Chicago, and will under the firm name of the Rodgers-Thayer Engineering Co. offer his services as an expert in this particular field. As an evidence of his ability Mr. Rodgers can point with pride to a large number of successful plants now operating installations which he planned and constructed. Among these may be mentioned the Laclede Fire Brick Co., St. Louis, Mo.; the Wabash Clay Co., Veedersburg, Ind.; Burnham Bros., Milwaukee, Wis.; the Atchison Paving Brick Co., Atchison, Kas.; the Capital City Vitrified Paving Brick Co., Topeka, Kas.; Robert Nesch, Kansas City, Mo.; Marshalltown Pottery Co., Marshalltown, Iowa; Minnesota Clay Co., St. Paul, Minn., and the Western Brick Co., Danville, Ill. Mr. Rodgers is prepared to demonstrate that this system is suitable for any ordinary plant. Many small plants as well as large ones can use it with much profit. Those who desire information on this subject will do well to consult with Mr. Rodgers—see ad on page 436—for he is an acknowledged authority. His experience and success entitle him to the degree of Master of the Waste Heat System.

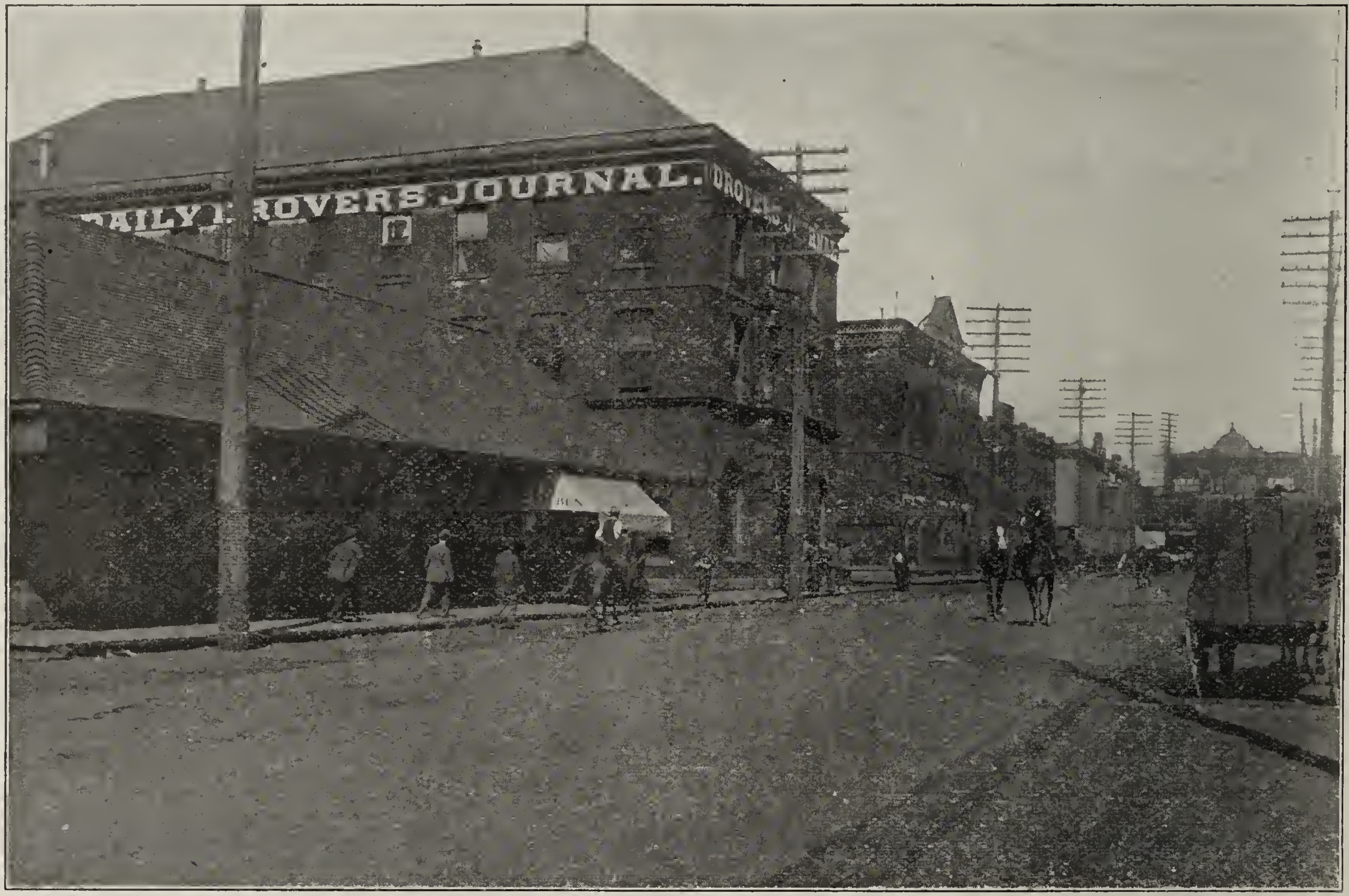
L. E. Rodgers, Chicago, Ill.

Written for The Clay-Worker.

REDEMPTION OF THE CHICAGO UNION STOCK YARDS.

The Important Part Played by Purington Paving Brick In This Great Work.

In 1865 THE LIVE STOCK business in Chicago then scattered in different parts of the city, was redeemed from chaos by the incorporation of the Union Stock Yard and Transit Company and the opening in Halstead street of the enormous acreage of the present greatest live stock market in the world. For the past five years the Purington Brick Paving Company has been instrumental in the redemption of this great market from mud and ooze and unsanitary filth—the combined product of Chicago's low-lying plain and the natural characteristics of a barnyard.



Main Thoroughfare, Union Stockyards, Chicago, Paved with Purington Block.

That the work of redemption is going on successfully and satisfactorily is attested by the fact that the officials of the Chicago yards are constantly entering more and more orders for thousands of "blocks" with which to continue the paving of the streets and pens of this shipping center, while the yards in Omaha are making similar demands for Purington's material. Paving is now a regular item in the annual budget of the Union Stock Yards Company and will continue to be, it is said, until the entire yard area, at present comprising 475 acres, is properly paved. Since 1889 there has been on the average more than an acre of paving blocks laid down in this area annually. In 1901 more than two acres were paved with brick.

The following table shows progress in this line of necessary improvement since 1899:

Year.	Sq. Yards.	No. Paving Blocks.
1899	32,000	1,792,000
1900	66,179	3,308,898
1901	98,590	3,752,322
1902	78,571	2,937,742
1903	60,719	2,240,528
Total	336,659	14,031,488

It was in 1865 that the first step was taken toward centralizing the live stock market of Chicago for the convenience of buyers and shippers. At this time, although even then the cattle business transacted was considerable, it was scattered through a number of small stock yards, each of minor importance compared with the present center of this industry and each located in a different section of the city. This condition was a source of some confusion and needless expense. With the marked increase in this trade in the latter part of 1864 and the opening of 1865, these individual yards proved quite inadequate to handle the growing business. As a direct result a new company the present Union Stock Yards Company was formed to establish a yard large enough to accommodate the cattle traffic of the city—or pretty nearly that of the entire middle west. This company did not propose and has never attempted to engage in buying or selling live stock. Its province has been merely to provide proper facilities for the reception, care and handling of the thousands of animals which are now received daily. Starting with the 320 acres of space which was opened as the "yard" on Christmas day, 1865, the company has now acquired 475 acres (420 of which are either bricked or planked), with 250 miles of railroad tracks and 25 miles of streets, thus offering the best shipping facilities and the most complete service of any market in the world. In addition the sale barns and grounds provided are unexcelled.

In this great area are the huge packing plants of Swift, Armour, Nelson Morris and the rest of the big men in the packing business. Here live stock commissioners, whose names are known the world over, have their headquarters. Here also is located the Dexter Park amphitheater, where the world's best records for sales of pure bred stock are held. Here late last fall was held a stock show which distinguished judges of cattle from England and Scotland declared was the best exhibit ever brought together. This in short is "the stock yards," the institution of which Chicago is perhaps most proud.

When a distinguished foreigner comes to this city, the question is jokingly put by paragraph writers for the local press, "Will he visit the stock yards or the university?" Generally he sees both, but if there is a limit to his stay the Halstead street attraction is the one which wins the favor of his regard.

Now the fame of the stock yards as an attractive place for prize exhibits of live stock has become widespread only within a comparatively short time. And even now it may be as well that the average visitor to these exhibits does not wander around through the tract west and northwest of "Packing Town" and view the sights nearer the shores of "Bubbly Creek." Should he do so he might forget the spick and span appearance of Exchange avenue and Dexter Park with their wide brick paved ways in removing from his person the mire of the unredeemed portion of this great territory.

When the union yard was first opened on Halstead street with 120 acres of pens, the appearance generally was that of the Augean barnyard on a day in March. Chicago is as flat between Halstead street and Ashland avenue as it is anywhere. In addition there is a subsoil of clay under much of this area. Natural drainage conditions are poor, as is indicated by the name "Bubbly Creek," applied to a branch of the Chicago river, which has been widened to the stock yards back door. Of paving there is none to speak of in the streets, at least none that under these unfavorable conditions proved durable. The pens were floored over with planks, which was impossible to keep clean. The filth oozed up between the cracks, making the flooring slippery and oftentimes completely hiding it. As a natural result the planks quickly rotted and had to be replaced with new once or twice during a year. The disadvantage of this system was two-fold. The expense of the constant repairs was great, and the difficulty of maintaining sanitary conditions kept down to some extent the standard of the market. When the time came to make a change along this line, the various materials for paving streets and pens were considered, and one by one rejected. Pine blocks would be

Excellent Brick Paved Streets and Runways at the Chicago Union Stock Yards.

little if any better than plank. Objections were raised to granite on account of cost and surface, and asphalt and macadam, because of the constant necessity of repair, were quite out of the question. Now it happened that about nine years ago D. V. Purington had furninshed a small quantity of vitrified brick to the Union Stock Yard Company for the paving of an alley leading in from Halstead street along the north end of the Transit House—the official hostelry of the Union Stock Yard.

Well at about the end of the discussion as to material for paving the yard and making it worthy of the business that it provided for, we may imagine that a recess was taken to go over to Halstead street and take a look at "Purington's brick." The brick, or blocks as they are called now, were not aware that they were up for inspection. If they had ever thought about themselves at all it is probable that in their downtrodden condition they had never considered themselves as anything more than ordinary alley paving blocks. As a matter of fact they had never been laid with especial care, being as has been said merely the paving of an alley. However these sturdy blocks were given small chance to dust themselves or level themselves, even had it been possible for them, before the committee of inspection appeared. Still though trodden upon for a long four years these blocks had improved upon the conduct of the orthodox worm, and not turned. The appearance was about all that could be asked as far as the paving blocks were concerned considering all the circumstances of the work done in putting them there. This piece of paving, now somewhat archaic for Chicago, is still to be seen and looks rather respectable in spite of a depression here and there. The brick are unbroken and the surface without a break. So satisfactory was the record of this sample of brick paving that the management of the yard decided to use the same material in reclaiming the yard from the mud. Brick evidently could wear. It was easy to keep clean. And that was what was wanted.

Exchange avenue, the main street running from the main entrance, was first paved, together with some of the pens. Dexter Park was not long in being improved. Pens were drained and then floored with the new paving material. In their annual report at the close of 1900 the company has this to say regarding improvements:

"The Union Stock Yard Company has recently inaugurated or completed many radical improvements in the yard, which are of much practical value in handling and caring for the thousands of animals received.

In the last two years many thousands of yards of filling have been put in and millions of paving brick laid in pens and alleys to replace planking, making a permanent flooring, which is cleaner and safer for animals to travel over. Thousands of feet of sewers have been renewed and enlarged and new lines have been constructed—improving radically the sanitary condition of the yard. Much more work of this nature is contemplated and in progress.

'An immense sheep house has just been completed. This house has a capacity of over 30,000 animals, making a total sheep capacity of 80,000 head, is paved with brick, well lighted and ventilated, etc."

Since the date of this statement the work of improvement has gone on steadily, brick having been laid down in most of the important streets and down the long alleys. Time was when it was a dirty job to traverse Exchange avenue afoot, from the Halstead street gate to Swift's, or even as far as the Exchange. Now, however, a broad boulevard smooth and clean for a street in the stock yard, sweeps back from the main gate for over a mile. The brick paving block supplied by the Purington Company has proved satisfactory in every way. They never wear smooth and always offer a good footing to the animals. They are burned to withstand the alterations of heat or moisture and frost peculiar to the Chicago atmosphere. So perfect is the composition that the stock yard people have found that they can lay them on the side instead of on the edge, and save money. In preparing pens with brick flooring, the drainage arrangements are completed, a place generally being provided for the moisture to seep through quickly to the sewer opening. A base of sand is then thrown in, tamped level and the brick laid on top and leveled off. This is the method adopted by the Yard Company.

Thus the task of reclaiming the Yard is going steadily ahead. Last year the Purington Company furnished nearly two and a half million paving blocks to the "cause," 855,000 of which went into 15,000 square yards of Transit and Laurel streets. What additions will be made to the "footing" of the "Yard" this year is as yet unknown, but will probably be worth mention.

SCRIP.

OUT OF FIRE UNSCATHED.

William Barclay Parsons, chief engineer of the Rapid Transit Commission, returned recently from Baltimore. Mr. Parsons went to the burned city to view for himself the effect of the fire on modern fireproof buildings.

He was quoted as saying:

"I found that all the modern, really fireproof buildings had come out of the conflagration practically unscathed and intact, the first reports to the contrary nowithsanding.

"By really fireproof buildings, I mean those where the steel frames are protected by non-combustible material, such as brick and terra cotta, with a thin curtain wall on the outside attached to the steel frame, and with doors and partitions of brick or terra cotta. There were a number of such buildings, from twelve to eighteen stories in height, within the fire zone, and I visited a number of them. I found them structurally substantially uninjured. The steel frames were not distorted, and the fireproof partitions and floors were all in place, except occasionally, when a heavy safe had broken through the flooring and fallen two or three stories.

"In these fireproof buildings everything combustible had been absolutely destroyed; every vestige of furniture, doors, trim and floor was gone. To give you an idea of the intensity of the fire which raged within these buildings, let me tell you that even the sleepers, which are long pieces of wood encased in the concrete floor and to which the transverse flooring is nailed, had been consumed, and this notwithstanding the fact that they were protected on three sides from contact with the flames by non-combustible concrete, and were detached from one another. As for the walls, I found those in which the chief component part was brick stood the ordeal best. As in other fires, the walls made of granite fared worse. Under the influence of the extreme heat the granite scaled badly, and practically all the walls in which granite was used will have to be replaced.

"Terra cotta, as a general thing, stood well, the damage to the exteriors composed of that material being chiefly due to falling debris of nearby buildings."

Mr. Parsons advises those interested in the construction of modern office buildings to visit Baltimore.—*New York Builders' Bulletin.*

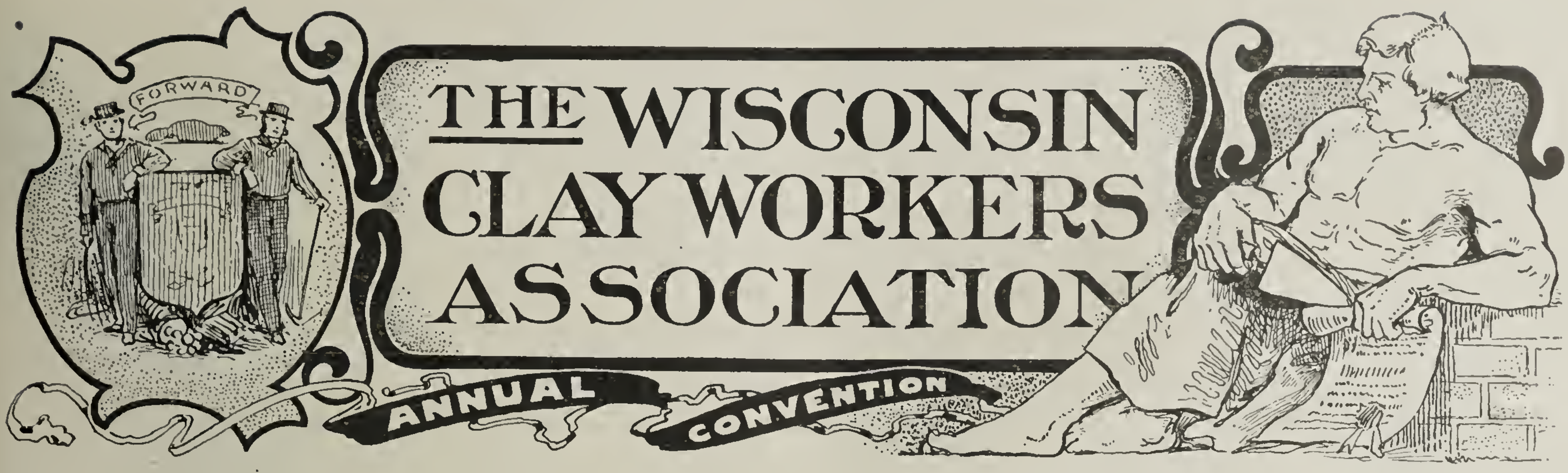
THE SECOND VOLUME OF THE SEGER TRANSLATION.

Volume II of the translation of Seger's Collected Writings, the work of the American Ceramic Society, has now been out for some time. It is hardly necessary to say much about Seger's work since a great deal has already been said concerning it. It is the foundation of modern ceramic knowledge and no one can be familiar with the principles of the art of clayworking without having read this famous collection of ceramic essays.

The second volume of the work treats especially and in the most direct and practical way with glazes and colors, porcelain, white ware and floor tile bodies, the investigations of brick materials both for building and fire brick, the manufacture of gas retorts, the use of Seger cones, the consumption of fuel and the power required in making brick, and many other subjects.

The defects of glazes and their remedies are treated in a masterly manner, while the articles on under glaze colors, white ware glazes, porcelain bodies and especially the article on Japanese porcelain bodies and on the famous copper red glazes, are classics of ceramic literature. Many valuable tables are contained in the volume which also comprises the interesting letters which Seger wrote from the Vienna and Paris Expositions.

This volume together with Volume I can be obtained by applying to the secretary of the American Ceramic Society, Stanley G. Burt, Rookwood Pottery, Cincinnati, O.



PROCEEDINGS OF THE FOURTH ANNUAL MEETING OF THE WISCONSIN CLAYWORKERS' ASSOCIATION

Held at Portage, Wis., March 1 and 2, 1904.

THE CONVENTION was called to order at three o'clock, Tuesday afternoon, by President Sanborn, who said:

Gentlemen of the Wisconsin Clayworkers' Association—I am very glad indeed to greet you here in Portage and I have great pleasure in introducing to you our Mayor, Mr. J. E. Jones, who will welcome you on behalf of the city. (Applause.)

ADDRESS OF WELCOME BY MAYOR JONES.

Mr. President and Gentlemen of the Convention:

It is more in the line of custom than of necessity for the mayor of a city to tell any gathering of citizens representative of a great industry of the country that they are welcome, especially so when a community seeks to keep pace with modern enterprise.

Our little city of 6,000 people is no exception to the rule and in telling you that the hospitality of Portage is extended to the clay workers of Wisconsin and adjoining States I have but one regret to express and that is that your meeting is at a time of the year when it is impossible for you to get the best impression of our natural resources or of the beauty of the city that you honor with your annual gathering; but, like most Wisconsin cities, we have been through a pretty hard winter. Our streets show it, our pocket books show it, our wood piles and coal bins show it and our people have felt it; in fact, they have been pretty well frost bitten. But, gentlemen, that fact will not deter them from giving the brickmakers a warm reception.

Had you visited us in the summer we would have been delighted to show you many points of interest to the average citizen of the northwest, for within our limits we can show you much of historic character. The Fort Winnebago of olden times is the Portage of today. At the old fort three-quarters of a century ago were stationed many of the prominent men who have made the history of our nation what it is. Within a stone's throw of where you are holding your meeting is the apex of the shed that divides the waters of the Gulf from the Great Lakes; besides the historic character of our city which we all delight to rehearse.

We could show you much of a substantial character developed by modern enterprise; we could show you many homes and buildings all constructed of Portage brick. We don't have to import our brick. We make the best on earth right here in Portage. We have plenty of clay and sand—sand to burn.

But our information is to the effect that clayworkers are not good summer resorters. They are too busy in the summer kneading the stuff that makes the dough while other people are enjoying the beauties of nature. They are busy hacking the brick and dodging the storms. Therefore, as brickmaking is essentially a summer job, we presume that it is of necessity that you hold your conventions while the frost is too deep to permit you to dig for clay.

Your association, like other associations of a kindred nature, it can be taken for granted, is mantained for the building up of the business of your industry. It can also be said that the coming together for discussion, for comparison of thoughts and ideas and the application of methods brought to light by the intelligent exchange of opinions in gatherings of this character is responsible for the wonderful advancement of all great American industries.

But it is also true that sometimes these associations go too far and digress from their true mission just long enough to boost the prices and control the output. But, of course, the brickmakers would not do that, for one of your number has told me so. He says that the best article should bring the best price in the market and I agree with him. He further says that your association is to discuss the best methods to make the best article at the least cost, and as I presume he meant the least cost to the consumer, we will leave it there and wish you God speed.

Gentlemen, again I wish to assure you that the people of Portage are pleased to have you with them. Everything is open to you—our homes, our hotels, our business places, our public buildings, our literary societies and even our police station. You can appoint your own mayor and other unsalaried officers to serve your needs; have a good time generally, only don't put it into the heads of our two brickmakers to raise the price of brick again.

I hope your meeting may be the source of great benefit to the brickmaking industry and with these few words, intended as words of welcome, I will give way to your president, Mr. Sanborn, who knows more about brickmaking than I do about making speeches. (Applause.)

Mayor J. E. Jones, Portage, Wis.

Secretary Bright: The next in order, gentlemen, is an address of welcome by President Sanborn on behalf of the Clayworkers of Columbia county.

ADDRESS OF WELCOME BY PRES. SANBORN.

Gentlemen of the Convention:

Our Honorable Mayor has given you such a hearty welcome I feel that I cannot say anything that will interest you, yet it may not be amiss for me to express a few words of welcome in behalf of the clayworkers of Columbia county, and in their behalf I bid you a most cordial welcome to our midst at this time.

I feel that we are greatly indebted to our friend Prof. Buckley for the part he took in perfecting an organization of the clayworkers of Wisconsin and we very much regret that he is unable to be with us at this time, for I am sure that we all enjoyed having him with us as he did very much to make our meetings interesting and I feel that we shall all miss him. We will hope that the time may soon come when he can be with us at the meetings of this association.

While we shall have papers presented on subjects that may be of interest to us, to make this meeting pleasant and profitable to all, we trust that every one will feel that they have a responsibility in the carrying out of this programme and that all will feel free to enter into the discussion of these subjects as they are presented.

We trust that the season of 1903 has dealt kindly with all of you, that your business has been prosperous and your ledger shows a substantial balance on the right side. So far as we have been able to learn, the outlook for the coming season is very flattering and we sincerely hope that the season upon which we are about to enter may be the most profitable that the clayworkers of Wisconsin have ever experienced.

While we are discussing these subjects let us not forget to relate any new experiences that have come to us since our last meeting so that others may be able to profit by our successes or failures, as in this way only can we receive the greatest benefit from these meetings.

At our last meeting at Green Bay I think I promised those present that if they would attend this meeting I would show them several blocks of brick pavement that had been in use for six years without showing any perceptible wear, also several miles of macadam streets as can be found anywhere. Am very sorry that they are so deeply covered with snow that you cannot see them for yourselves. If you are fortunate enough to visit our city at any time during the summer months we will prove to you that our assertion is true.

Again, gentlemen, I bid you a most cordial welcome. (Applause.)

President Sanborn: Following the program, it will now be our pleasure to listen to W. M. Ellis, of Endeavor, Wis., who will respond for the Association to the addresses of welcome by the Mayor and your humble servant.

Pres. F. L. Sanborn, Portage, Wis.

RESPONSE BY W. M. ELLIS.

Mr. President and Gentlemen of the Convention:

An old book tells the fable of an ass who was ambitious to train with the lions. Finding a lion's skin he donned it and presented himself among the lions as a bona fide member of their fraternity. But his great ears gave him away and he made no great impression as a lion. As the lions, however, were having a convention the ambitious ass having a magnificent voice was appointed to give the response to the address of welcome and for the remainder, having notable ears, he was to devote himself to listening. So the preacher appears among the lions of the clay industry.

Attendants upon a convention like this can, in the nature of the case, contribute less to the advantage of their hosts than they themselvse enjoy of profit and pleasure. It is therefore the more fitting that their entertainment be received graciously.

We find here upon the borders of the great marshes and sand stretches a wonderfully beautiful and manifestly prosperous and public spirited city. Its citizenship must be of the best sort. We have naturally particularly observed the perfect brick paving of the main street, a standing testimonial to the pre-eminent value of brick for paving; and the rows of fine brick residences and business blocks in which, unlike the buildings of most cities, not one poor brick appears. This bespeaks the uniformly conscientious work and artistic taste of your brick manufacturers. It must be that the brick industry has an honorable standing in your city.

We were interested last year at Green Bay in meeting a gentleman formerly connected with the construction of Canal and Fox river improvement who had also made a study of the surface geology of this region. It appears, as said, that the Fox river in immediate post-glacial times flowed in the opposite direction from its present course, emptying its waters, through an extended estuary in this region, into a great lake lying westward and northward from here. By this means the clay wash of the Wolf river and Fox river valleys was brought thoroughly mixed and laid down in this region, making perhaps the finest brick clay beds in the State. From its natural clay resources as well as from the excellent railway and waterway transportation furnished here this place seems destined to become one of the great brickmaking centers of Wisconsin.

We, the representatives of this industry, enjoying now the abundant provision made for our visit, wish to express in some simple way our hearty appreciation of this hospitality and of the privilege we have in convening here. Mayor Jones and Mr. Sanborn, we thank you. (Applause.)

President Sanborn: There are not so many present as we hoped to see, several of our members who intended to be present have been prevented from coming by various causes. They have manifested their interest in the association by letters of regret, which I will read.

Letters from Absent Members.

Mr. F. L. Sanborn, Portage, Wis.:

My Dear Mr. Sanborn—I have hoped all along that something might turn up by which I could be present at the meeting of the Wisconsin Clayworkers' Association next week. It is the first meeting that I have missed since the association was organized three years ago. Last year I thought there was a chance of my being situated by this time so that I might take an active part in promoting the interests of the Wisconsin clayworkers, by carrying on further investigations leading to a better equalization of the clay resources. This opportunity, however, has not been given me, and I can only hope that there are others in Wisconsin who are taking as great or greater interest in the development of this important industry.

Since I began to interest myself in the clay resources of Wisconsin about five years ago, there has been a great improvement in the methods of manufacturing throughout the State. This improvement is attributable not so much to my investigations as to the work of the Wisconsin Clayworkers' Association. This association has not injured any one's private business; it has not had a tendency to effect the industrial relations between manufacturers; and neither has it resulted in a decreased output. On the other hand, it has resulted in an improvement of the quality of the brick; in more cordial and friendly relations between the manufacturers: in an increased output; and in some instances in larger profits to the brickmakers.

Interest in this organization ought to increase each year and an effort should be made to disseminate useful information to the brickmaking fraternity in matters pertaining to the clay industry.

I wish you would extend to the association my most hearty greetings and best wishes for a successful meeting. I remain,

Very respectfully yours,
E. R. BUCKLEY.

Mr. F. L. Sanborn, President Wisconsin Clayworkers' Association, Portage, Wis.:

Dear Sir—I regret very much that I am not able to attend the meeting of our association as I am blessed with an attack of rheumatism that compels me to stay at home; indeed I am very sorry that I cannot meet all my old friend brickmakers, but I invite you all to call on me if you happen to come anywhere near Chippewa. I had the pleasure of seeing Mr. Kennedy (our vice-president) a few weeks ago and I wish that all the members of the association would come when convenient. Give my best respects and wishes to all the members; I am with you in spirit if not personally.

Hoping you will have a good time and much success in your deliberations, I remain

Yours faithfully,
J. B. THERIAULT.

President Sanborn:

Dear Sir—I had hoped to be able to attend the annual meeting this week, but the serious illness of my brother prevents. I am pleased to enclose you under separate cover a number of copies of Commentaries on the Wisconsin lien law, which were compiled by the Wisconsin Lumber Dealers' Association. At the Lumber Dealers' Convention just held in Milwaukee, a committee was appointed to endeavor to have the next legislature make the lien laws more nearly perfect or at least to see that we did not suffer at the hands of our wise law makers.

Wishing you a very pleasant and profitable meeting, I am

Respectfully yours,
LAWRENCE C. WHITTET.

President Sanborn: Gentlemen, these brief addresses complete the formal numbers arranged for this session. If there are any standing committees to report, we will be glad to hear from them.

Mr. Hinckley: I believe there was a committee appointed at our last convention for the purpose of securing, if possible, the passage of a satisfactory lien law by our State Legislature. Evidently no formal report is ready for our consideration. I therefore move that the President appoint a committee to take up this work and that they be authorized and instructed to secure, if possible, the passage of a satisfactory lien law during the next session of our Legislature.

President Sanborn: The suggestion of Mr. Hinckley is timely, for before we meet again there will be another session of our Legislature. I will appoint Mr. G. W. Kennedy of Manitowoc, Mr. Clifford Chase of Milwaukee, and Mr. L. H. Cordes of Watertown to act as that committee. They are requested to do what they can in this connection and report the results of their labors at our next annual convention.

After considerable informal discussion, the matter was submitted to a vote and carried unanimously. There was also considerable discussion on the advisability of so arranging the programme as to provide for only two days' sessions instead of three as heretofore, and on motion the secretary was instructed to govern himself accordingly, and in the future limit the sessions to two days.

President Sanborn: As is our custom, I will appoint a committee to canvass the matter of time and place for our next convention and nominate officers for the ensuing year. There being no objection I will appoint on that committee, J. G. Hamilton, J. W. Hinckley and W. M. Ellis. The committee is requested to report tomorrow afternoon at four o'clock, so that we may complete our work at that time, instead of extending it over until Thursday morning

On motion of Secretary Bright the session adjourned.

SECOND SESSION.

The convention was called to order Wednesday morning at 10 o'clock by President F. L. Sanborn.

The President: The first thing on the program this morning will be a paper by H. DeJoannis, of Chicago, who will give us "A Clay Journal Talk."

CLAY JOURNAL TALK.

Mr. President and Gentlemen of the Convention:

When I received the intimation that I was to deliver a paper before this association I looked eagerly on the program for the subject and when I found out that it bore the indeterminate title, "A Clay Journal Talk," I imagined that its very lack of definition would make it easier for me to write something which would interest you and which, at the same time, would not cramp me between too narrow limits. I have found, however, that license imposes upon one as many restraints as law and I have been much taxed in my endeavor to bring order out of chaos.

It may perhaps be well to consider for a moment the condition of our industry at the present time. The clayworking industry today occupies a position among other trades second only in importance to the iron industry. There is still a huge demand for common building brick; the utilization of pressed brick in public structures has increased wonderfully during the last decade. Who can disassociate the construction of the skyscraper with its frame work of steel from the fire proofing which incases and protects it. Hollow block, once looked upon askance as being of insufficient strength to bear heavy structural strains, has fought its way to the front, having triumphed under every test. Tera cotta is now considered indispensable in the attaining of ornate architectural effect. Sewer pipe has gained so wonderfully in public esteem that it is estimated that several hundred miles more of it were made in 1903 than in the previous year. Drain tile has been in such demand that many brickmakers in 1903 confined their efforts to its production. In addition to this many other uses for clay products have been found which were not dreamed of ten or fifteen years ago—the clay burial vault, the clay fence post, the clay food locker and the clay window sill and curb.

A review of our products would not be complete without a reference to the paving brick industry and the manufacture of roofing tile. Every day brings to us clippings from newspapers announcing sharp competition between brick and its competitors, asphalt, macadam and creosoted wood block, and in the majority of instances paving brick, the best material, has given them all cards and spades.

Roofing tile, a comparatively new industry, has gained much in the esteem of architects and an effort is now on foot to cheapen its production so that it may be enabled to enter the lists to unhorse its chief opponent, the wood shingle. There is no question that if this is done our roofs will be substantial indeed.

As regards our competitors in the constructional line, what should be our position towards the sand-lime brick industry? Is it likely that the sand-lime brick threatens our prosperity? I guess not. On the other hand it is my opinion that the advent of the sand-lime brick should rather be welcomed by the clayworker than otherwise. It will be a most useful ally in the fostering of the erection of pretentious business blocks in small villages and towns where the price of pressed brick for facing purposes is considered prohibitive and where a structure of all common building brick is not considered to be sufficiently ornamental. A sand-lime brick front will give architectural beauty equal to that of a pressed brick front at a lower cost and admits of a great variety of color application. The sand-lime brick may be considered as an intermediate product between the ordinary face brick and the pressed brick.

Only two years ago the champions of concrete prophesied that their material would revolutionize the structural industry and that the brickmaker would find a considerable reduction in the avenues of marketing its products. Concrete superstructure was cited as the model fireproof structure, but during the year 1903, much to the dismay of the revolutionists no less than fifteen cases of collapse in concrete superstructural work took place, all of them representing the best concrete construction, the best material and the best of workmanship. The cause of these collapses were never discovered, prominent engineers and architects not venturing an opinion, and the property loss was very large. Possibly the most noted of these was the collapse that took place on December 4th, at Pittsburg, Pa. The Bellefield apartment building collapsed, ten concrete floors finding their way into the cellar, killing several workmen employed on the job and involving heavy property loss. The disaster was attributed to unfavorable weather. In concrete matters the best does not seem to be distinguishable from the worst.

Having thus reviewed briefly the state of our industry we will proceed to trace the cause of the existence of the clayworking journal, its use and its specific work. Words are the crystallization of thought. The pressure of the hand, the look of the eye, the gesture are but primary steps to human intercourse. The utterance of the first word of the human speech was the doorway to domestic, tribal, municipal, national and international communication. As long as men lived within easy access of each other and commerce was confined to a certain radius a spoken word sufficed. Then the curve of the hand in gesture and the straight line of the emphatic forefinger were finally transmuted into the straight and curved strokes of the written speech, indented primarily on the clay tablet. It was not recorded which of the two, love or commerce, was the mother of the invention of writing, since that time, however, each fresh human interest has demanded a written or printed medium of expression; hence the existence of the clayworking journal. The distance of the purchaser from the supply man demands a bridge of intercourse. By this means the knowledge of our experienced men can be conveyed to thousands separated by many parallels of latitude and longitude, and the need of many can be voiced into the ears of those able to furnish immediate relief. The clayworking journal then, has done good work in this regard.

W. M. Ellis, Endeavor, Wis.

This was primarily its mission, but with age the scope has widened. The clayworking journal is now the forerunner of fresh enterprises, the index of new avenues of activity, the extender of business. Information on new processes and inventions stimulates thought, activity and inspires fresh efforts and investment of capital. Investigation of these brings patronage to the railroad. Investment results in an increase of freight traffic, the satisfaction of the supply man, the employment of labor, the building up of local trade, the erection of more pretentious dwellings and important public structures—a pebble of well directed enterprise thrown into the pool of inactivity, the resultant ripples in circles ever widening until the outermost ripple breaks on the shores of successful realization.

The clayworking journal is also an educational factor. It is a supplyer of fresh ideas. The diversity of conditions renders it impossible for one man's experience to apply equally with advantage to the cases of difficulty encountered with all others. But he who is desirous of learning will derive from that which he reads the knowledge of the things he ought to imitate and avoid, and to know what not to do is often of more importance than to know what to do.

Having got thus far let us dwell for a moment upon what should be the attitude of the readers of the clayworking journal. Even if the clayworker takes all the papers pertaining to his trade interests there is generally one that meets his needs more than the others, paying attention to some phase of manufacture in which he is especially interested. His duty to that particular journal is clear. He should not only be willing to glean information from it, but should also make it his pleasure and duty to present his experiences to its columns in return so that others may benefit by his personal experimentation. Americans have often made a joke of the habit of the readers of the London Times who regularly pen their opinion of municipal or national affairs to its editor, but I assure you that the familiarity of the Times' readers with its correspondence columns has been probably one of the most important factors in the upbuilding of that great newspaper and has discovered to the Times many a valuable paid contributor. In this respect clayworkers as a rule are apathetic, diffident, self-depreciative or negligent. Diffidence and self-depreciation are possibly the main weaknesses. The clayworker has an idea that the matter should be presented in ornate style with well poised sentences, proper lanced paragraphs and written in irreproachable caligraphic manner. Let me hasten to inform you on behalf of all the clayworking journals here represented that such is not the case. What we need in our special work are ideas and experiences, no matter how presented. Some of the very best stuff I personally have ever handled has been written apparently on wrapping paper by the light of the kiln fire with a coal-grimed hand, every other word misspelled, and without respect to capitals or the divisions of sentences and paragraphs. Be not content, therefore, always with receiving. Freely ye have received, freely also give, for it is an inviolable law that we must give out to take in, a relationship as inseparable as that of light and darkness, life and death, evolution and involution and thesis and antithesis. The fact of the matter is that we are all in one boat and all must pull together, all parts of a whole whose harmony must prevail to attain the highest order with the maximum degree of progress.

H. De Joannis. Chicago, Ill.

—"For so Work the Honey Bees."—

Creatures that by rule in nature teach
The act of order to a peopled kingdom.
They have a king and officers of sorts;
Where some like magistrates, correct at home,
Others, like merchants, venture trade abroad;
Others, like soldiers, armed in their stings
Make boot upon the summer's velvet buds,
Which pillage they with many marts bring home
To the tent royal of their emperor;
Who, busied in his majesty, surveys
The singing masons building roofs of gold,
The civil citizens kneading up the honey,
The poor mechanic porters, crowding in
Their heavy burdens at his narrow gate,
The sad-eyed justice with his surly hum
Delivering o'er to executors pale
The lazy, yawning drone. I this infer
That many things, having full reference
To one consent, may work contrariously,
As many arrows, loosed several ways,
Come to one mark. As many ways meet in one town;
As many fresh streams meet in one salt sea;
As many lines close in the dial's center;
So may a thousand actions once afoot
End in one purpose, and be all well-borne
Without defeat.

The attitude of the reader of the clayworking journal should not always be that of the critic and the knocker, or else cannot the highest good be attained or given. The editor of the journal generally has enough troubles in getting his journal out on time without the receiving of any more kicks than he deserves. All enterprises have their petty annoyances and the editor's life is not wholly made up of checks from advertisers and dollars from subscribers. I will spare you all the harrowing details, but will merely point out that a cut mislaid, a photograph lost in transit to the engraver, a stupid typographical error, an illustration placed upside down by a careless pressman in the middle of the night, any of these may suffice to empty the vials of wrath on the editorial head. Add this to the arduous duty of answering the innumerable letters unloaded by the mailman in the course of a year on his desk. Here are some samples:

"Dear Sir—Please tell me all you know about brickmaking, as I am thinking of going into the brick business."

"Dear Sir—Could you place me in touch with capital to develop clay land here? I have no money of my own, but if some one could be put forward by you I could secure an option on some valuable land which I have been told will make good building brick."

"Dear Sir—What is the best way to build a kiln? I have never built one before. Please send me full instructions and drawings."

Here is one from the other side of the water:

"Dear Sir—Can you tell me the whereabouts of one James Cowden? He left Bristol, England, 23 years ago and I understand that he has something to do with the real estate or building business either in Chicago or San Francisco. The last time I heard of him was in 1902, he was then in New Jersey. If you find out where he is kindly let me know. I thought as yours was a brick paper you might be able to find out something about him."

From all such missives, good Lord deliver us.

Finally a word on the make-up of the editor of the journal. He should be under all these trying circumstances as courteous as possible, he should endeavor to know as little as possible and as much as possible. Little so that he may sympathize with the troubles of beginners, much so that he may help them, in every way he can. His must be the duty of adapting himself to the needs of the industry. His fingers should be constantly on the pulse of trade and the trend of his product should be always upward and its tone never anything else but optimistic. Newspaper men have a bad name and I don't know what is going to become of us. A little story I heard recently, however, gives me the hope that the true standing of editors' work may be appreciated after death, if not before. A lawyer recently sent the following words of consolation to the widow of an editor of a near-by town: 'Dear Madam—I cannot tell you how pained I was to hear that your husband had gone to heaven. We were bosom friends, but can never meet again."

According to this there is hope for yours truly. (Applause.)

President Sanborn: This subject is now open for discussion. If anybody has anything to offer we shall be glad to hear from them.

GENERAL DISCUSSION.

Mr. Kennedy: Mr. President—I think Mr. Joannis has brought out in his address one thing that ought to be impressed on our minds, and that is that a man ought to give his experience when he has accomplished something, and not be afraid because he is not a writer, and so is not able to clothe it in flowery language and put it up in fine style. He is too apt to say: "Let the other fellow do it." I remember once when I was learning the carpentry trade from my father. We were going to put up a barn, and it was rather a difficult task. There was a man who had just landed from the old country and who was helping us. When we got ready to raise the barn he said, "Wait a minute." He got a pole and tied a rope around it, then he put it over the end of that rafter and put the pole up and held it in position. Now, my father had been a carpenter for a good many years and had a good deal of experience, but he had never thought of this before. Now it is just the same with this brick business. There is many a man with a small yard that accomplishes something. In looking through these papers you will see that we do not get much news from them. They say "Let it be the big men who have big yards write these articles." Now, some of the best brick made in Wisconsin is made in small yards, and I have been told that when a person wants to get an all-around good man he invariably goes to the small yard to find him.

Now, I am not running for office, and never expect to, but if the Clayworkers of Wisconsin will come to Manitowoc next year we will try to have the town so open (with the exception of the police station) that the entire town will be yours. We have a deep river, a harbor and a car ferry, and many other attractions. When it comes to talk about the hospitality of our town, then I will not compare it with Green Bay, Milwaukee or Portage, but will wait until you come to Manitowoc, when you can judge as regards that yourself. (Applause.)

Mr. Bright: Mr. President—I think Mr. Hartwell ought to have something to say on this subject and am sure we would all like to hear from him.

Mr. Hartwell: I think that Mr. Joannis has covered the ground so well that there is nothing further to be said.

President Sanborn: We would like to hear from Mr. Randall.

Mr. Randall: I will simply corroborate the wise reference of Mr. Hartwell, and will say that the subject was well covered. Trade journalism is like everything else—the man who seeks information will find it. The man who looks for trouble will find it, and the man who derives the greatest benefit from his trade journal is the man who reads it most carefully. The man who tells me there is nothing in these conventions and that the matter contained in the trade journal is of no use to anyone impresses me at once, without further argument, with the conviction that he is one of the "wise boys" who thinks he knows it all. Now, the same thing holds true in regard to this convention work. We have assembled here some thirty people—an aggressive and enterprising body of men—but the men who could just as well have attended and are not here have missed an opportunity of great value to them in a business way, and also have missed a good social time. "All work and no play makes Jack a dull boy," and it is a good thing for all men in the manufacturing business to get out of the grind once in a while and get together and talk over matters of common interest, not only in matters of trade, but in matters of social interest; and we who come here having a common feeling of fellowship will find these conventions especially beneficial and helpful, and we will probably live a little longer for having attended these meetings, which are without doubt a help to your work.

President Sanborn: We would like to hear from Mr. Covey, of Minneapolis. Mr. Covey, haven't you something to say along this line?

Mr. Covey: I do not represent a clayworking journal, but a trade paper. I will say that I am entirely in sympathy with what Mr. Randall has said. It applies not only to our paper, but to almost any trade paper. You can always get good general information in attending these meetings. There is hardly anything open for discussion, I think, but, as the last speaker has said, all of these papers are open to careful reading. Of course, the clayworking journals treat of the manufacture of brick, while the journal I represent refers more to the disposal or marketing of brick. It is not my business to help you in the manufacture of your ware, but after you have made your brick we want to help you market them. That is what we are here for.

President Sanborn: Has anyone else anything more to say along this line? If not we will proceed to the next number on the program by Mr. Hamilton, who will give us a talk on the "Price of Brick."

PRICE OF BRICK.

Mr. President and Gentlemen of the Convention:

The subject which our honorable secretary gave me to discuss before this convention, viz: "Price of Brick," represents, I believe, one of the most important questions before the brickmakers of today. Upon this question of price the profits of the yard are very largely dependent, and yet it is one of the points that we are apt to give the least attention to. By this I do not mean to infer that we give more attention than we should to the manufacture of our product, for of course it is understood that we must produce a good brick in order to find a sale for it, and the better the quality of the brick, the greater the demand for it will be. We must remember, though, that while we are making a good brick, if our price is not right, and does not bear the proper proportion to the cost of manufacture, the finances of our company will never assume proper shape, and our dreams of riches to be dug from a clay bank will not be realized.

In the manufacture of brick the first thing to be accomplished is to make a good brick, and the next thing is to make them at the lowest possible cost. New methods of manufacture, drying and burning are tending to lessen the cost of manufacture, and we come to these conventions that we may keep in touch with the improvements that are being made in this line. We cannot put our brick upon the market before we know what they are costing us, and there are so many items which enter into the cost of production, that it is necessary that we should have some systematized method of handling our accounts. A book account should be kept with each department of the yard and all items of expense connected with each department should be charged in its proper place. This will not only enable us to determine the cost of making brick in each department, but it will enable us to more readily detect any leak that may exist, since we know approximately what it ought to cost to operate each department. If the expenses of the plant are kept only as a whole, we might know that our brick were costing more than they should, and still not know which department was to blame for it. By dividing the sum total of these expenses by the number of brick manufactured we have the cost per 1,000 brick. We are now in a position to know what we can afford to sell brick for, and if the time comes when we must sell on a close margin of profit we can do so without running the risk of selling at or below cost, and subsequently at a loss.

J. G. Hamilton, Grand Rapids, Wis.

It is not my intention to attempt to say what amount any of us should charge for our brick, for we have to determine for ourselves what percentage of profit we should make from the conditions that exist upon our respective yards. But there are several things that have to be taken into consideration before we can determine upon a proper percentage of profit. The manufacturer whose annual output is only one or two millions or less as the case may be cannot reasonably afford to sell brick at as low a price as one whose output is many times larger, for the reason that it usually costs more per thousand to manufacture on a small scale, and the same percentage of profit that would apply on a large business would not be adequate on a small one. Then, too, it is necessary that we should look ahead a few years so as to be prepared to meet new problems which are pretty sure to present themselves. A clay bank which may have been considered almost inexhaustible is liable to be worthless in the course of a few years, or the expense of obtaining the raw material may have increased to such an extent that we can no longer afford to work it. After a plant has been run a few years numerous repairs have to be made. Perhaps it is found necessary to install a new machine or a new engine to replace the old. The price of fuel is gradually increasing, and labor unions are organized to control the price of labor. These are conditions which we will all of us have to face to a certain extent in the future, and what do the small profits of a few years represent in the face of such a problem. We are all engaged in the brick business for the common purpose of benefiting our financial condition, and with that end in view it is necessary simply as a business proposition that we should take advantage of existing conditions and get as high a price for our brick as we possibly can. The price of nearly all commodities is controlled very largely by supply and demand. There was a shortage in the oat crop the past year and in consequence we are paying 45 cents a bushel for oats. The lumber supply is not keeping pace with demand and the price of lumber is high as a result. The same thing is true with nearly every product you can name. Why should it not hold good with brick?

I do not think that any of us need fear that we shall amass so great a fortune out of the brick business as to have our honesty or integrity questioned. At any rate we have yet to hear of such an occurrence.

As I understand it this association was not organized for the purpose of controlling prices, and I think if such had been the case, it would have been found a difficult thing to accomplish, as there are too many differences in the relative cost of maunfacture between different ones of us. It may cost nearly twice as much to burn one clay as another. Fuel and lobor conditions are apt to be very different in different parts of the State, and other expenses may necessarily be greater. What can be done though, is for the manufacturers in the same town or in a district where the conditions governing the cost would be practically the same to all, to enter into an agreement between themselves as to what they would sell brick for. The past two years have been very satisfactory to most of us, I believe. Prices have been good and we have had about all the business we could handle. Under such conditions it is not necessary that we should enter into an agreement of this kind, but it is safe to predict that such conditions cannot long continue, and we should prepare ourselves now so that when the reverse conditions do come we will be in a position to face them.

I would like to call your attention for a few minutes to the matter of freight rates. It is conceded by all that the present rates are excessive, but it is the granting of reduced rates and secret rebates about which the greatest complaint is being made. The Illinois Brick Company are furnishing the common brick used in the new paper mill which is being built in our city. These brick, I understand, are costing about $6 per thousand f. o. b. Grand Rapids. The tariff rate from Chicago to Grand Rapids is 10 cents per 100 pounds, and as those brick cost $4 in Chicago, it is evident that a rebate is being made, amounting to practically one-half rate. This is all being done right in the face of an interstate commerce commission which is supposed to detect and prevent all things of this kind.

J. W. Hinckley, Green Bay, Wis.

There certainly should be some way in which Wisconsin manufacturers can be protected against Chicago brick, and if this association can find some means by which that end can be accomplished, it will be conferring a great benefit upon each and every one of its members. (Applause.)

GENERAL DISCUSSION.

Mr. Randall: The matter of the "Price of Brick" as it shows upon the program might carry a wrong impression to some who may have an eye upon your meetings and your work and who are not familiar with the objects of this association. The local press and those who buy brick of you may be led to think that perhaps the principal intent of this organization is for you to get together and determine the price at which your ware should be sold during the coming season. Many organizations are formed for the whole and sole purpose of arranging and controlling the price. That is entirely foreign, as you know, to the purposes of this organization, and you yourselves well know why you could not control the price if you wanted to. It is the small manufacturer usually who sets the pace and makes the price of clay products, not the large manufacturer; but it is a good thing for you to get together and talk as to the cost of your product, for in that way, especially if you are competing in certain territories, if you will get together and talk over the cost of your product and determine what your product is really costing you, you may properly use your influence for the purpose of maintaining a stable market. Really the greatest good will come to consumers by such meetings as this, because it tends to a better understanding and more improved method of manufacturing, which in turn means a cheaper product.

Mr. Hinckley: I have never yet heard in any of our meetings the suggestion made as to what the price of brick should be, so I do not think the public could have any information as to that. Of course, in certain localities the local manufacturers regulate the price of brick. I know that the first year I got into this brick business a company was organized over in the Fox River valley. They went around and got options on all the brick yards there. They came to me and wanted to get an option on my yard and wanted me to take stock in the new company. I promptly declined it, for the reason that I thought it a big business for these men to handle. Well, I finally gave them an option on my yard and they accepted it. They had a scheme by which each man who went into this organization was to have stock in the Fox River Valley Company, and each man was to run his own yard, and the Fox River Valley Company were to have $3.00 per thousand for brick loaded on to cars, and they expected at that time to fix the price at $5.00. They were going to sell them at $5.00. Well, the thing was pretty nearly perfected, and one of the men who had agreed to sell his yard for $10,000 or $12,000 (by the way, he was a man who never kept any books and probably never knew what his brick cost him) went to a friend of his who had a little more ability, and the latter told him how much it cost him to run the business, and when they got through with his figuring he sarted right off to headquarters and asked to have his money back and gave up his option. Well, it resulted in the disruption of the scheme and everybody makes his own brick now. So I think these attempts to regulate the price of brick to any great extent are failures, but I think every brickmaker ought to feel that he is getting a price sufficient to cover the cost of his brick and pay for buying new machinery once in a while. I think that perhaps these meetings and these matters that are talked over and discussed may help everybody to arrive at a conclusion as to what they can afford to sell brick for.

In regard to freight rates, I think the whole brick industry of Chicago is organized into one company. I do not know the principle on which they run it, but I know they call it the Illinois Brick Co., and during the last year they have been making more brick in Chicago than they could sell. They say they are selling brick all over the country at less than it cost to make them. I know that they deliver them here in Wisconsin, and at a price which we could not make brick and deliver for. I should judge from their sales that they are selling somewhere from $3.50 to $4.00 per thousand. I know that this winter they passed a dividend on the preferred stock and had not made enough to pay it. They finally elected a new set of officers to run the thing and raised the price of brick.

In regard to the other point which Mr. Hamilton made in regard to freight rates, and which he thinks they may adjust by a rebate of half of the regular rate, I believe that all railroad companies have a rule whereby a man building a manufacturing plant upon the line of a certain road that road gives the manufacturer half rate on material. I believe all railroad companies do this.

Mr. Haas: Mr. President and Gentlemen—I would like to say a few words on this freight question. For the last four years some parties putting up buildings in our city would start to erect a building, we will say, last fall, and they would begin shipping in material for that building from the time of its commencement. Well, they will ship in the cement and brick, but spring would come and that brick would be sold for some other building, and they would keep shipping in brick and selling same, and still always getting the brick for this certain building, and still getting the brick on this half-fare rate, and they have been selling them for 50 cents less than I sold my brick for last summer. So there is something wrong somewhere.

Mr. Bright: I have heard quite a few members talking about the price of brick, and some blame the Illinois Brick Co., others blame Rickert & Schwartz, others blame the railroad companies. Yet, I do not think we can blame the Illinois Brick Co., but it is like the last speaker said—"There is a nigger in the fence somewhere"—and the only thing I can see to blame is the railroad companies, and if there is anything done at all I should think the committee could attend to it.

Now, in regard to putting a price on brick, I do not think that would be a wise thing for any of us to do. I would be in favor of it if I was employing all union men. I think that the only way that any manufacturer can be protected from the union men is to form a trust. I do not think that was the intention at all, but I do think that the committee ought to look into the railroad rates and try to adjust them.

Mr. Hamilton: I think the Inter-State Commerce Commission is supposed to look into these matters. The rebate is given in the shape of a seeker's rebate. It is a hard thing to detect, but the Inter-State Commerce is supposed to detect it, but whether or not they can find sufficient proof is where the trouble comes in.

Mr. Chase: I do not think we ought to enter into a general discussion of the price of brick. Of course the question of the Chicago brick being shipped into the State is one that we may get at through the Inter-State Commerce Commission, but I think that will regulate itself. They have not been making any money the last year or two. They have put the price of brick away down, and in order to keep their yards going they have sent their surplus stock out through the State wherever they could sell it. I do not think we will be confronted with this the coming year as much as we have been in the past. Another thing that will be in our favor is that the stocks are very small in Chicago. I understand they have only a stock of 90,000,000 at present and they have orders for 150,000,000. Of course they manufacture very rapidly, but I think they have not accumulated stocks as they usually do during off seasons. I think the question of price should be left with the various localities, and I do not think it ought to come into this meeting. I do not think we ought to discuss the price of brick, the raising of price or the adjustment of price, because it will get out, the press will get hold of it and it will not do us any good; they will not ununderstand it the way we do.

Mr. Haas: I should like to add in answer to Mr. Chase in regard to their being short of brick. I notice they are getting all they want right in my own town, and they cannot be far short when they are getting them at so low a rate.

Mr. Chase: There has not been enough demand in Chicago to keep the yards fairly busy. Of course if that exists there they certainly will take the $6.50 price in preference to no price at all. If conditions are right for building in Chicago there will be little surplus. Of course last year they had great trouble with their labor unions, and building did not go on as they expect to have it the coming year.

Mr. Haas: I should like to have Mr. Chase inform us as to whether or not they are making the same size brick as they have been making. Now, they were turning out quite a large brick. It was a very large brick that they delivered in Fond du Lac. I manufacture an 8x3⅞x2¼.

Mr. Chase: The different yards in Chicago manufacture different sized brick—some of them much smaller than others.. I think the largest come from the North Side yards. The Chicago Brick Co. manufactures small brick; the Illinois Brick Co. manufactures a fair-sized brick, about 2⅜, I think.

Mr. Vogt: I think I can give some information on that subject. About July 1 last they informed us that as we had been complaining about the small size of brick that all yards in Chicago had agreed on a uniform size of brick, to be 2¼x3⅞x8. But the fact is that in some of the yards they make an exceedingly small brick, hardly 2¼, while in other yards they run to a larger size. I know one or two of the yards, outside of the Illinois Brick Co., continue to make a good-sized brick, too large to suit us in Milwaukee. I think the intention was to use the size of brick agreed upon, but they evidently do not do it.

President Sanborn: Our next number will be a paper on the "Advantage of good machinery," by Mr. Frazier.

ADVANTAGE OF GOOD MACHINERY.

Mr. President and Gentlemen of the Convention:

I have been asked to say a few words, taking as a subject "The Advantage of Good Machinery." On glancing at the topic our first thought was "that's easy," for who would presume to argue the negative or contend there was anything other than an advantage in the good of everything, whether intangible or tangible, spiritual or material? But on second thought it occurred to us that the committee on topics might have had some experiences to the contrary, and had actually set those, who by their methods or actions, seemed to negative the proposition, whether ignorantly or deliberately, they had done it, and upon turning over some leaves of experience of our own, we were confronted with some evidence easily establishing the fact that there were some who did not acknowledge that there was an advantage in good machinery, because they had deliberately purchased machinery of inferior quality, buying certain kinds purely and simply because of cheapness in price, seemingly on the ground that anything would do. We do not mean to include in our criticisms those, who when in the market, bought the goods the very best obtainable, yet those tools shortly after became inferior in comparison with later apparatus put on the market after they had bought, although we do think such a man will succeed who no matter how short the time he has been using his latest purchase of tools, upon discovering improvements, hastens to discard the old and establish the newer devices. You may say that this takes a great deal of money—granted. But it is a penalty attached to manufacturing in these days and is accepted by all the successful manufacturers, not alone manufacturers of brick, but manufacturers of all kinds, and we know of certain manufacturers who have made several changes in a few years, each time throwing into the scrap heap apparatus which have been in use scarcely one year, and when installed was the very best obtainable, and these parties when spoken to about what seemed extravagance had to say in defense only "that the machinery is out of date, so and so has perfected such improvements, that in using them, great saving is effected and if we are to meet competition, and as we are in business to stay, and for profit, we could not do otherwise than introduce these improved tools and throw out the old ones." No, we have no criticism for such, but rather words of unlimited praise, and hold them up as people worthy of imitation. But we must criticise those who when buying machinery, do not buy the good of the kind they are buying; those who seem to be looking for the cheapest to be had, pretending to do the work the prospective buyers have in mind to do, for they ignore the principle underlying our theme, and from the very start, labor under the disadvantages arising from competition with manufacturers possessing the good machinery, and soon are far behind in competition with the day of failure close at hand. Now in the foregoing picture we do not think we can be accused of overdrawing or exaggerating it, nor do we doubt that there are many who are influenced by such considerations, and yet at the same time, there may be many who have not in the past, or in the present, given any consideration to

E. R. Frazier, Chicago, Ill.

the advantage to be found in good machinery, because it has been neglected by them who might, if the matter were brought home to them in detail, be led to profit by what they might be told of the advantages good machinery always promise, and with this thought in mind, we shall briefly outline these advantages, with profit, we hope, to those whom it is our desire to benefit.

We have many among our list of acquaintances who openly acknowledge, that through mistaken ideas, they attempted to start into the business with what they regarded as "cheap machinery," and found it was the indirect cause, at least, of their losing a great deal of money during the first year or two, and they realize this difference when they have come to the point of buying a better class of machinery. We have a case in mind where the parties stated that they would have saved several thousand dollars if they had put in certain machinery, naming it, which was generally known to the trade as being superior to that which they had first installed. The loss was not only in broken machinery and the expense of repairing the same, but through the interruption of their works, and loss of prestige with their trade through inability to fill contracts. The pay-roll and fixed charges go on just the same, whether they made brick ten hours per day, or whether they were broken down and made brick only three or four hours a day.

A brick yard is a works that should be run and produce product from the time the whistle blows and the pay-roll begins until quitting time, when the whistle blows and the pay-roll ends. The men themselves become discouraged on a yard where the machinery is frequently broken down. They realize that it is a bad proposition for them, and the better class of employes seek work elsewhere. The machinery that is strong, able, that runs all day long, and the machinery that is of liberal capacity, enabling the men to complete their task early, and get away early instead of being kept late to make up a daily output, is the machinery that is popular with workmen. It makes the brick yard and makes the employer popular with the better class of men. In the South, or with the colored labor, this feature is so well recognized that many brick yards have put in the largest machine to enable them to complete their daily task by three or four o'clock in the afternoon, instead of having machines whose normal capacities were just what they wanted to make and thus compelling them to keep their hands at work until late in the evening. They handle that class of labor to better advantage by giving them the task, and giving them the machinery that will enable them to complete their task early and get away early. These men especially like the work this way. And they know that this is true with all kinds of labor. The comfort and satisfaction to the proprietor, in knowing that he has machinery that can be relied upon, and going to the works without fear of finding everything broken down, is worth more than the difference in the cost of "poor machinery," and that which may be designated as "good machinery."

E. M. Kraatz, Milwaukee, Wis.

Good machinery should be properly designed, and proportioned for the work it is to do with a large margin of safety over estimated strains. It should be so designed that those parts which are necessarily subject to wear, and which, from the nature of the business must be removed from time to time, can be easily and quickly replaced. These parts should also, if possible, be made so that they do not involve expensive machine work. If in the design of the machine, some additional first cost is involved through designing in such a way that those parts necessarily subject to wear can be renewed at less cost, even if the first cost of the machine is thereby greater, we think that "good machinery" would dictate such a policy in its design. The machine maker may save in the first cost of building his machine by ignoring this principle, although he might even make the sale to his customers at a lower first cost price, his knowledge and judgment should dictate the other course, as he would thereby serve his customer to better advantage.

These points being observed "good machinery" would dictate that the parts of the machine should be made to interchangeable jigs so that duplicates can be furnished which will absolutely fit without any machine work or fitting in the yard. Duplicate parts furnished must go to their place instantly, and thus save delays and valuable time when renewing parts. Each part should be so designated that no elaborate description is necessary to identify the part. The simple specification of a number, or letter, or both in combination, should be sufficient to designate the piece beyond question.

We have briefly and in a general way given you what, in our opinion differentiates "good machinery" and yet have said quite enough to convince anyone who is willing to be convinced of the "advantage in good machinery," and it affords me no little pleasure to affirm, based on years of selling experience, that never before as now, that the majority of buyers are honestly looking for, and buying the very best machinery obtainable for the work they are contemplaing doing, and we take it as a most encouraging sign of the times. Let then every buyer insist on the good, the best in what he buys and the advantages accruing to him and a steady and reliable working plant yielding him fair returns, will be his portion, making it really a pleasure and not a task to do business. (Applause.)

GENERAL DISCUSSION.

President Sanborn: The subject is now open for discussion.

Mr. Bright: This subject is like one of our other subjects on the program—is confined to a certain few—and I think there are not many machine men here. Mr. Smith, of Iowa, is here, and I think he can discuss this matter. We would like to hear from Mr. Smith.

Mr. Smith: I think Mr. Frazier has fully covered the entire ground, and I do not feel that I have anything to add.

President Sanborn: If there is no discussion to be had on this subject, and as it is nearly time to close this morning's session, we will now proceed to our next number on the program, which is a talk on "Burning Brick," and which was assigned to Mr. Kraatz, of Milwaukee. We have just received a letter from Mr. Kraatz stating that he will be unable to attend this convention in person, but has had the kindness to send us his paper, and in his absence we will request that Mr. Ringle read the paper.

BURNING BRICK.

By Emil M. Kraatz, Milwaukee, Wis.

Mr. President and Gentlemen of the Convention:

Manufacturers, irrespective of what line they may be engaged in, have long since recognized the importance of coming together at stated periods for the purpose of comparing notes, as it were, to ascertain the underlying and correct principle involved in the manufacture of their respective articles. Thus have the brickmakers for a great many years ceased to look upon one another as enemies in the marts of trade, but to the contrary, assemble on the various occasions for the purpose of exchanging views on the different methods and best ways of manufacturing brick for the market.

—Brick Burning—

The subject, "Brick Burning," having been assigned to me, and recognizing the fact that this gathering is for the exclusive purpose of enlightenment, I, feeling my inability to treat the subject with the proper consideration, made a futile effort to shrink from the responsibility. I know all brickmakers will admit the question of properly burning brick is one of the most important factors in their manufacture. It is singular enough that it should be the last part of the process of manufacture which shall arrive at a state of commercial perfection. To properly understand why the art of brick burning has not progressed and kept pace with that of the manufacture of brick, we must all admit that had it not been possible to attain even fair results in the old scoved kiln with a wood fire at any cost, we, under pressure of conditions, would have been glad to avail of the modern appurtenances which would enable us to burn our brick properly at a reasonable fuel cost. The time, however, has arrived when the trade is demanding a uniform quality of well burned brick. While it was possible to secure fairly good results with a wood fire in the old fashioned scoved kilns, those of you who have been forced to change from wood to coal have found that we have run up against a serious condition. This new condition is forcing the brickmaker to a point of realization that something must be done to enable him to arrive at the successful solution of this problem. Brickmakers in the past as a rule, had a tendency to build wide kilns. It is not to be denied that with a wood fire it was possible to burn an extremely wide kiln and secure fairly good results, but to be able to burn with coal as a fuel, brickmakers do not like to concede the fact that kilns should be made narrower than is necessary with a wood fire. In securing the results with a wood fire on a wide kiln, it was necessary to cross-fire. Those of you who have had the experience will substantiate the position which I take that brick cannot be successfully burned with coal and resort to cross firing. Therefore, it is absolutely necessary to carry the heat from the bottom to the top of the kiln in one and the same operation; consequently, the brick kiln should be narrow enough so that the heat can be carried to the top of the kiln successfully and with the greatest possible ease and dispatch without any interruption or bother. Any brickmaker who will study the proposition will find that when he arrives at the proper width of the kiln he can burn his brick at a reduced fuel cost. Singular as it may appear, there are few brickmakers who will concede the importance of having the permanent clamp kiln walls in which to burn their brick. Such walls should be built about three feet thick at the bottom and taper to an eight-inch wall on top. Respecting width of kiln, so far as experience has led us, we find that brick kilns should not be more than twenty-one feet wide on the inside, that this width of kiln can be properly handled and the heat carried up throughout the entire width of same without interruption and obtain first-class good results, thus being able to burn your brick hard, clear out against the wall and within one or two courses of the top, and in every respect secure good commercial results. If the brick kiln is made too wide, the men handling the kiln usually experience what is known as the unbalancing of the heat, that is, it will not travel up through the kiln evenly, the center either being ahead or behind. In attempting to keep it even an enormous loss of fuel and time takes place. You who have had the experience can testify with me that in extremely wide kilns, it is impossible to secure good color and a well burned, nice brick. On light colored brick, there are likely to appear streaks of calico color and ashes of soot on the surface of the brick, which is very detrimental; on the other hand, with permanent walls and narrow kilns, the ashes from the soot and the calico effect are largely eliminated. The only way in which I can explain this effect is that the fire in a wide kiln has a sort of revolving, choking effect, where in the instance of a kiln not too wide, it produces a clear, piercing, bright heat, burns a nicer color and produces a better product.

There was delivered at the Brickmakers' Convention recently held at Cincinnati, Ohio, an address by Prof. Orton on the fire effect on clay and how the process of burning was developed. While I did not have the privilege of hearing it in person, it is reported that the speaker conclusively proved that all clays contain more or less carbon which it is necessary to burn out of the clay, and that it depends largely on the nature of the clay as to the rapidity with which this process can be carried on, but in any event to accomplish good commercial results, the process should be one of uninterrupted progress and be followed up as closely as the nature of the clay will permit, while to retard this action is not only detrimental to the brick, but is expensive, and that extreme width in kilns brought about the retarding process of burning out the carbon and producing the necessary degree of heat. Hence, his argument for narrow kilns.

To refer to the brickmaker and the machine man, had it been possible in years past to evade the machine man successfully and manufacture the brick by hand, the tendency on the part of humanity would be to remain in the old rut, but pressure of conditions forced brickmakers to accede to the advantages and avail of the improved machinery for the making of their brick or quit the business. The reason why brickmakers have not made rapid progress in the burning of their ware is that this force of conditions above mentioned did not assert itself so strongly in the burning proposition; in other words, to speak from experience, it would be to the advantage of the brickmaker were it not possible for him to secure any results with the old fashioned, crude scoved kiln, that it should be as much of a burden to him to burn his brick in this manner as to mold them by hand. Were such the case, you would find brickmakers throughout the land adopting the permanent clamp kiln walls and modern appurtenances which would enable them to consume fuel of any character or description, and thereby secure first-class good results.

Your humble servant desires to plead guilty along with the others in that we have no permanent walls as yet, even though we recognize the superior advantages to be obtained by the use of them. It is, however, fair to state that since we recognize the value of this improvement, we have been somewhat at a disadvantage on our yard owing to the fact that the location of our kiln-seat is not satisfactory, and we do not want to build the permanent walls until the kiln-seat can be permanently located. Furthermore, the fact of our having an arrangement whereby we are enabled to consume the poorest grades of coal slack and secure as good results in the cased walls as we formerly were able to obtain with wood, naturally had a tendency to cause us to overlook the important factor of the permanent walls. It is, however, our intention to build them in the immediate future, and when we do, they shall not be more than twenty feet wide on the inside.

Any of the members present, especially interested in this method, I would cheerfully give any further explanation desired, either here or when visiting our works at Milwaukee, where the system can be seen in practical operation.

Thanking you for the honor and kind attention. (Applause.)

GENERAL DISCUSSION.

President Sanborn: Has anybody anything to offer on this subject?

Mr. Vogt: Mr. President—I think he omitted to state the method he employs in burning brick, thinking that it would be improper in a convention of this kind to say anything much in favor of a certain system. In conversation with Mr. Kraatz he said he was sorry he could not come, and did not refer to the system he uses in his yard, thinking that if anybody wished to know about it he could give them the information personally. The system he employs is forced draft. While the first kilns that he made under that system did not turn out very well, of late the results are better. Of course, Milwaukee clay is hard to burn, and it generally takes from sixteen to eighteen days, sometimes twenty days. The last brick that he burned he burned in eleven days, and it was very fine brick. Of course, I cannot go any further into the details of this method, but I know that the results in the last two kilns he burned were very good.

Mr. Ringle: Mr. President—I am not a brick burner myself, but we use at our yards what we call the permanent wall kiln mentioned in Mr. Kraatz's paper. I notice he puts particular stress upon the width of those kilns. Our kilns are about twenty-four feet wide, but our fireman (by the way, we burn wood) had an opinion that he could just as well burn brick in those kilns twenty-eight and thirty feet wide as twenty to twenty-four feet wide. I presume it is different, as Mr. Kraatz states, in burning coal, but he thinks it is a matter of economy to have kilns wider when you are burning wood for fuel. Our kilns are those permanent wall kilns. The wall is four feet at the base and runs up to about eight to twelve inches on the top, and so far as the burning is concerned we have good results. They are not all the same width. The last one we built is about twenty-six feet wide, and they average about twenty-four feet.

Clifford Chase, Milwaukee, Wis.

President Sanborn: During last season we attempted to burn three kilns with coal. From the first kiln I do not think we got out of 200,000, 15,000 good brick. The second kiln we burned we succeeded better, but we found that brick in places were too hot; we did not get the heat through the kiln properly. That kiln we burned as Mr. Kraatz did—without cross-fire. The third kiln we burned, we burned as we formerly have, changed from one head to the other. The brick in that kiln were very much better than they were in the second kiln; the hard brick came up nearer the top and those below were not as hard as they were in the second kiln, but the brick in the benches were badly discolored, so that we could not use them for face brick. Consequently we decided to abandon that method of burning, but, as

Mr. Kraatz says, I am satisfied that he has made a success of it in his yard. He has sent us a very nice paper, and I am satisfied that our kilns are too wide to burn coal successfully. We have got to narrow them up to not exceed twenty-feet. I would like some system of burning coal successfully, and one that would not cost any more than to burn wood, and yet we have not found it in this State.

I would like to hear from Mr. Zimball in regard to this matter.

Mr. Zimball: We have never used anything else but wood, and I do not know anything about the burning of coal.

Mr. Chase: We use coal and wood. I think you can burn kilns with coal and wood the same width you can kilns with wood only and get satisfactory results. We have a grate that slides into the arch. The grate is about five feet long, but there is a great deal in a man getting accustomed to using coal. Since we have become accustomed to it we have found that we get satisfactory results, although not as good a color as we did by burning with all wood. The sulphur in the coal seems to have some effect on the color. We have not experienced any trouble in burning kilns forty feet wide. I understand that in the Boss system that they reduced that to thirty-five and thirty-six brick wide.

Meeting adjourned to 2 p. m.

THIRD SESSION.

President Sanborn: Before going on with the program the Committee on Resolutions should be appointed. I will name as that committee Mr. H. De Joannis, Mr. George Hartwell and Mr. A. Duerwechter.

Secretary B. H. Bright, Black River Falls, Wis.

President Sanborn: The next thing will be the Treasurer's report:

Mr. Ringle: To the Wisconsin Clay Workers' Association—The following is a statement of receipts and disbursements as Treasurer of the association:

—Receipts—

Received of J. G. Hamilton, Treasurer	$ 95.58
Receipt of payment of stenographer	10.00
Received of G. J. Schwartz, railroad rebate	8.50
Annual dues collected	12.00
Total receipts	$126.08

—Disbursements—

Paid stenographer	$ 10.00
Postage and express charges	2.50
Miss Resch, computation of proceedings	55.00
Expense of F. L. Sanborn, Chairman of Committee on Size of Brick, as per bill	7.00
Bill of B. H. Bright, Secretary, as per bill in excess of collections	29.89
Balance on hand	21.69
	$126.08
Balance on hand March 1, 1904	$21.69

Respectfully submitted,
JOHN RINGLE, *Treasurer.*

Mr. Bright: Mr. President—Before proceeding further with this meeting I would like to tender my resignation as Secretary of this association, and wish to thank the members for the privilege and honor conferred upon me and for the kindness shown me during the past year.

Mr. Randall: Gentlemen—I would like to say a word for the benefit of the incoming Secretary, whoever he may be. The present Secretary has done good work for you, as evinced by the records up to this time. He is influenced, I think, in his decision to refuse a re-election by the labor put upon him in collecting statistics, and in part by the knowledge that the statistics and information obtained is of very litle value. Now, to relieve the incoming Secreatry, I make a motion that the matter of gathering this information be left entirely with the Executive Committee, the President, Secretary and Vice-President. You will find it difficult to retain a Secretary more than one year if you urge upon him so much labor with no benefit derived thereby. Your treasury would then be some $50.00 to $70.00 ahead, and you would have just as much information so far as practical value goes. I will say in this matter that you are wasting your efforts and your revenue both, and I move that the matter of discontinuing this gathering of statistics be left with the Executive Committee:

Mr. Hinkley: I would like to offer an amendment to that motion, that we positively instruct the Secretary to omit this statistical work. I get the report of the Geological Survey from Washington, and the information is double that to be obtained from our Secretary.

Motion unanimously carried.

President Sanborn: We will now have the pleasure of listening to Mr. Randall, who will favor us with an address on "Sand-Lime Brick."

SAND-LIME BRICK.

Mr. President and Gentlemen of the Convention:

When I received Secretary Bright's letter requesting me to present a paper at this meeting on the subject, "Sand-Lime Brick," I immediately replied declining the honor. Now, that I am here and see my name on the programme, I am much elated, for it is a great honor to have one's name enrolled upon the scroll of fame. To be included among the scientists who have been shedding light upon this subject is certainly a great distinction, and it is "up to me" to say something in evidence of my appreciation of the distinguished honor conferred.

I presume you have all heard various definitions of the word pessimist. The best that I have heard is, that a pessimist is one who given the choice of two evils, takes both. Now I am just the opposite of this sort of pessimist, or what is known as an optimist of high degree. If given the choice of several good things, I take them all. Especially is this true of brick. There can never be too many brick to suit me. Whether they are building brick, paving brick or fire brick. No matter to what class they belong, if they are *good brick,* there is a place for them all and the more that are made, and the more generally they come into common use, the better this old world of ours will be.

Brickmaking is generally conceded to be one of the most ancient industries known to man. From the beginning of the world, almost, brick have been made and burned. Brick without straw and brick with straw, and never in all these thousands of years have they failed to meet the requirements of the builder who desired a permanent and indestructible building material.

No industry, no matter how ancient, is sacred in the eyes of the modern inventor, so it has come to pass that a new manner of brick is now being made and offered to our builders, with the assurance that they are well worthy a place by the side of the old time-tried and fire finished products. If the claims of our scientists (may I say we scientists?) (Laughter) prove true, sand-lime brick will make a place for itself in the building world and prove itself a worthy member of our brick family. If by its introduction the cost of building may be so reduced that brick structures may take the place of those now built of wood, we can all rejoice in its success.

As it is always the case in the production of a new material, perfection cannot be hoped for at the very start. A certain amount of experimental work is inevitable, and for this reason the path of the sand-lime brickmaker will not be strewn with posies. There will be problems to be solved and obstacles to be overcome, some of which doubtless will be peculiar to each individual factory, just as is the case in the manufacture of clay brick.

Sand and lime are variable in their qualities and every manufacturer will have to adapt his plant to these varying qualities just as is the case in the making of brick and tile. To insure a uniform product, the sand and lime must be mixed thoroughly, every individual brick should contain an exact percentage of these ingredients, so that this process of mixing must be unvarying, and as near perfect as possible. Then, too, the materials must be uniform in the degree of moisture contained. It was details of this sort, doubtless, that Mr. DeLong had in mind, when he said in his able paper read before the National Convention, "We have had many things to contend with, and expect to have many more." To those of you who are specially interested in this subject, I commend the careful reading of Mr. DeLong's paper and the discussion which followed it, which was given in full in the February CLAY-WORKER.

The new sand-lime process appeals to many at first glance because of the apparent simplicity. What can be easier than the mixing of sand and lime? But when the operation is undertaken, it is found not so easy as it appears. An ardent advocate of the sand-lime brick, and one who claims to be an authority on the subject, writes:

"In the first place it is conceded by all that the best results can only be obtained when the lime is thoroughly slaked and reduced to its finest subdivided and dryest condition, and that if the steam-hardened product is to be uniform in quality and appearance, the lime must be uniformly well slaked and pulverulent to the greatest degree possible, and the mixture must be uniform in proportions, not only of the sand and lime, but moisture as well, and that in order to get this uniform mixture, each of the ingredients must be prepared so as to be brought to the same physical condition. For instance, if the lime were not brought to a proper state of dryness ,no amount of mixing would produce a mixture of the best character."

Now gentlemen, as you are all doubtless aware, Indiana is always to the fore-front in every progressive movement, whether industrial or political, and the making of sand-lime brick is no exception. One of the first plants erected in this country for the manufacture of sand-lime brick was that of the Ohlemacher Brick Co., Michigan City, Ind. Mr. Ohlemacher went to Germany, familiarized himself with the methods of manufacture in vogue there, purchased a complete equipment of machinery from German manufacturers and erected a plant on the shore of Lake Michigan, which has been in operation now for two years or more. They are making, I believe, common building brick only.

In this respect, the product of the Indiana plant differs materially from that of Mr. DeLong's. The latter intends to make front brick only by the sand-lime process and expects by furnishing front brick of moderate cost to the builders in his section to increase the demand for his common building brick, which he makes by the soft mud process on a plant that is unique in one respect—it is operated by water power.

If Mr. DeLong has sized up the situation properly, the introduction of the sand-lime process will not be at the expense of those now engaged in the brick business, but will be helpful to them in affording a moderate cost front brick that will encourage the use of brick where otherwise frame structures would be built. So you see, gentlemen, there is no occasion for undue alarm. Sand-lime brick may prove a formidable competitor in the front brick business, but this will not frighten those engaged in that line of work, for they are used to sharp competition, both among themselves and with those dealing in stone, marble, granite, and other building materials.

Mr. Taylor, here to my left, is the only gentleman present, I believe, dealing largely in front brick, and he can tell you whether he is much concerned by this new competition. Are you uneasy, Mr. Taylor? He says, "No," he does not mind it at all. Maybe that is because Mr. Taylor knows from experience that it requires peculiar ability, large capital, wide experience, and much knowledge of architecture and the needs of builders to enable one to successfully introduce a line of face brick.

The situation today in regard to the sand-lime brick is much the same as that of the dry press process some twenty years ago. Some of you who attended the early conventions of the National Association may remember how the advocates of that process were regarded when it was first introduced. Many brickmakers were fearful lest the dry press brick should crumble under pressure, others thought that they would not withstand the elements, that they would disintegrate and fall to pieces when subjected to freezing and thawing processes, and still others argued that only in rare instances could clay be found from which a passably good brick might be made by the dry press process. When some venturesome capitalist or manufacturer, more ambitious than discreet, tried and failed, from all sides you would hear, "I told you so." Yet the promoters persevered, and today, there are no better brick made in the world than those made by the dry press process, and they are being made successfully in almost every secton of the country.

Now does it not occur to you that history may repeat itself. That the sand-lime brick may in due course of time and the natural evolution of the business, occupy as enviable a place in the building world? Just now the process is in a formative state, though it is claimed that it has been operated in Germany for several years. Right here I am reminded of an incident at the National Convention. In discussing the question, the statement was made that sand-lime brick had been used extensively in Germany and one member asked, if those who had investigated had ever known of a clay brick manufacturer going out of business because of the introduction of sand-lime brick. He was answered in the negative. Maybe there is a grain of comfort in that for the timid ones.

There is one thing noticeable about sand-lime brick. Every one, it seems, who investigates it thoroughly, becomes so enthusiastic that they at once identify themselves in some way with the sale of the machinery or appliances used in the process. Enthusiasm is a wonderful force. It is really no use to try to stop an enthusiast, and not infrequently, he accomplishes what the skeptic says and believes is impossible.

The sand-lime brick is now regarded by many clayworkers as an unwelcome intruder, or an unworthy usurper. As a matter of fact, it may properly be classed as a ceramic product. Prof. Edward Orton, Jr., director of the School for Clayworkers, Columbus, Ohio, in an address before the learned men and scientists of Wisconsin, delivered at Madison, some months since, said in this connection:

"It should be said in advance that the clay industries alone cannot fairly and properly be discussed under this head, the discussion should include the whole length and breadth of the ceramic field. By this word 'ceramic,' the whole field of silicate technology is meant; not only the clay wares, but also glass wares and cement—in fact anything which is wholly or essentially a silica product."

So you see as we evolute and become full fledged ceramists, the sand-lime brick will be one of a common, though numerous and worthy family. Of one thing I am quite sure, and that is, that this new brick, if it comes into general use, will be made and marketed by men skilled in the art of brickmaking, if it is to be the success its promoters anticipate. Hence, you need not look at it askance, but may regard it as another of your products—I came near saying, the products of your kilns. They will be the products of your plants, I feel sure, and if by adopting this new process you can give the builder another indestructible element-defying material, you, the manufacturer, and the consumer, too, will profit thereby. (Applause.)

T. A. Randall, Indianapolis, Ind.

GENERAL DISCUSSION.

President Sanborn: Gentlemen—We have heard this excellent address by Mr. Randall. Is there any discussion of this subject?

Mr. Kennedy: May I ask Mr. Randall what the cost per thousand is?

Mr. Randall: Ask Mr. Joannis. He claims to be one of the promotors of sand-lime brick and, therefore, can tell you a great deal about it.

Mr. Joannis: I would be very glad to answer your question, especially if Mr. Kennedy could tell me the exact cost of making brick all over the United States. If you could lay down a definite statement for common building brick, and give me the basis of your statements, I could give you the exact cost of sand-lime brick. The cost, so far as the statistics I have to hand are concerned, is $2.85 to $4.25 per thousand. There is, of course, to be taken into account the cost of getting the sand to the plant. In the two cases I know of, the sand being hauled some considerable distance, and the cost of preparing the sand for manufacture, together with the cost of lime, which varies a couple of dollars sometimes in price per ton in one locality to the other, makes it necessary that we confine this to an estimate of between $2.85 to $4.25; but, after all, it does not make much difference how much they cost, because if you can "soak" somebody heavy enough you will make a profit anyway. Evidently it will pay to ship brick at $25.00 regardless of freight charges. If you can make sand-lime brick, and you can get $18.00 per thousand for them, you are still making money.

Mr. Weidman: What per cent. of lime is used?

Mr. Joannis: From 3 to 5 per cent.

Mr. Randall: The general average is from 5 to 10 per cent., depending on the quality of sand and lime, is it not?

Mr. Joannis: They have used 10 to 11 and 12 per cent.

Mr. Bright: It seems to bother the speaker as to how he came to have this subject, and I will admit that I was the guilty one, for the reason that I thought that all of these brickmakers were interested in the question of sand-lime brick, and so I selected Mr. Randall as the victim. Now, summing his talk up, I do not know that he favors one side or the other, but I think we all understand that those manufacturing a sand-lime brick will have their troubles just as we do. I do not think that we need to be scared out of our boots and quit the clay banks and go to the sand banks. Mr. Hartwell is a great advocate of the sand-lime brick, and I think we would all like to have Mr. Hartwell tell us something on the subject.

Mr. Hartwell: I do not know anything more than what Mr. Randall has said on the subject.

Samuel Gunther, Port Washington, Wis.

Mr. Brown was requested to give some information on the subject.

Mr. Brown: As I did not intend to make any speech here I did not prepare myself to make a speech, but I have looked up the question of sand and cement. I have just returned home from the East, have been in Michigan and Canada and looked over different buildings which have been built of sand and cement. I went over into Canada, where there was one building that had stood eight years. The reason I knew it had stood eight years was because the Masonic memorial was on the building and the year it was put up. It was put up in 1895, and the building looked as well from all appearances as when first erected. I had one of our best contractors from the city of Fond du Lac along to inspect the brick and also the building, and he pronounced it A1. The cost of this sand and cement brick depends pay to ship brick at $25.00 regardless of freight charges. If you used crushed or ground quarry stone you can make it cheaper than you can out of sand, if you get the right kind of quarry stone. There is a great deal of cement in this stone that binds it together, thereby making it considerably cheaper. We have made a test by freezing and laid a brick in water for twelve hours and put it out of doors over night. It was still harder and better when it came out after it had frozen than before we put it into the water.

Mr. Bright: Mr. Smith, of Iowa, is present and I think he is able to give us a good deal of information in regard to this matter. We would like to hear from him.

Mr. Smith: This is a subject that really I have not given much thought or study. Take it through our State of Iowa, I do not think we have any plants in the State, excepting one, that is making a concrete building brick. Of course, I suppose the mixture is something on the same principle, although with the machinery used they do not give it the pressure that they do in making a solid brick. The blocks erected of this brick in some cases are giving satisfaction, while in others it seems that you cannot depend upon them. We have some of them that have been erected now all the way from five to eight years that are showing up good still.

Mr. Haas: We have had quite a little talk on the sand and lime brick. I would like a little information in regard to stone that is ground up fine and mixed with lime and cement. I would like to ask the question whether there is any of these plants in existence.

Mr. Bright: We would like to hear from Mr. Covey in regard to this.

Mr. Covey: You will have to excuse my lack of knowledge. I do not come in contact with these things. As I said this afternoon, the journal that I represent is a paper that deals with the disposition of these brick products and not with its manufacture, so properly it is not our work to look into. These gentlemen representing the clayworkers are more properly prepared to talk about it.

President Sanborn: We will now hear the paper on "The Manufacture of Tile," by Samuel Gunther, Port Washington. We are unfortunate in not having Mr. Gunther with us in person.

MANUFACTURE OF TILE.

Mr. President and Gentlemen of the Convention:

We have been in the brick business for about twenty years and at the time we started we thought there was nothing else to be made out of clay. As time went on new inventions were brought out and the manufacture of tile was begun. The first difficulty encountered when we went into this line of business was to create a demand for the tile. It was something new on our country and people were not accustomed to its use. We at first manufactured about 50,000 and as we had no shed to put them in, had to take our chances on rain. We would put them out in the open air and trust to luck as to weather and when dry put them in a kiln and build a wall around them. The wall we built was not very strong and would not stand to be built complete at once, so we built it to a certain height and filled it up with tile, then we built it a little higher and filled it with tile again, and so on until it was completed. Then we got to the burning and inside of twenty-four hours the water-smoke was out and we started in with a big fire. We could not get the tile red hot, however, and we went on the top of the kiln to see what could be done. We had a double tier of brick on but they did not seem to check the draft, so we went and got some soft coal screenings and clay and spread them over the kiln. This had the desired effect and we had them burned in six days. We took them and stored them outside and when farmers came and saw them they asked what they were to be used for. When we told them they were to be used in swamps and low lands to drain off the water they could not believe it.

Of the first lot we burned more were broken than sold, and we gave away several hundred feet to the farmers so they could try them. The next spring they bought them by the hundreds of feet and said they gave satisfactory results. In the following years farmers began tiling big swamps, also high and low lands. We are informed by those using the tile that drainage on high land is just as beneficial as on low land. We are now manufacturing 300,000 to 350,000 tile per season.

The main tile used at that time was three inch and it was hard to sell the 4, 5, 6, 7 and 8 inch because they cost too much money. Now the smallest size used is from 4 to 8 inches. The reason for this is that the larger sizes do not become clogged up as readily as the smaller sizes and the difference in price is very small. The demand for tile is steadily increasing and we are shipping them all over the country in car load lots. We use a very rich clay and add about one-third of lake sand which makes them tougher and gives them more pores and they draw more water than without sand. We sell them as follows: 3 in., $12; 4 in. $16; 5 in. $20; 6 in. $30; 7 in. $40; 8 in. $50 per thousand. We have built heavy walls so that they may remain standing when they are empty. The arches for the fires are built the same as in brick kilns and the tile are set on top of the arches, being nested to save space. When the water-smoke is out we put on a covering of mineral wool to check the draft. It is the same as if you put a number of stove pipes on top of each other. If the draft is not sufficient we pull out one of the brick on top; if too strong, we cover it with mineral wool. You cannot check the draft suddenly, for if you do you will make the tile soft, there must be a little draft.

We used all wood for burning brick and tile a few years ago, but wood is running short and we had to get coal; although we have no grate or furnace, coal burned all right just the same, as it had sufficient draft, by putting in two or three sticks of wood and then several shovels of coal it makes a good fire and burns tile satisfactorily, the color of which are a cream white. Sometimes those on the corners are red and are very hard to sell. The farmers say: "Those are red ones; we want white." As they were so particular we tried to find a way to get them all white. We overcame this difficulty by using mineral wool.

When the tile began to settle in one spot we covered it with mineral wool so that the fire had to go elsewhere. We are now burning all the kilns white and we would not be without the mineral wool as this saves a great deal of fuel. We expect to burn all coal next season as wood is getting too scarce. We have been paying from $4 to $5.50 per cord for soft wood and have been mixing it with hard wood, all of which has been shipped in by boat.

We burn the tile just like brick by first getting the water-smoke out and then firing to the center from both sides. When they are burned enough in the middle we close up one side and fire from the other from 50 to 60 hours, then we change our fire to the other side and burn for the same length of time, then we close for three or four days, after which we sweep off the wool, letting in the air. By giving them too much air the top rows will all be checked and spoiled, which will also happen if too much cold draft is let in on to them when firing.

Now to come back to the drying part. We had a large shed, 100 feet long and 36 feet wide, built across a small creek, on posts, through which we get a good circulation of air. The floor is made of 1½ inch strips laid about two inches apart.

We are using the car system in our yard, having a main track from the machine to the tile shed and three tracks in the shed. By using a transfer we are enabled to use three cars so that when one is being loaded the other can be unloaded. In loading the tile at the machine we use an axle and one wagon wheel and stick the axle in the ground so that the wheel will be the proper height in taking the tile from the machine. We have boards on the wheel so that the boys can pile on one side while two men take them off at the other. When the car is loaded it is pushed to the shed and on to the side track so that the other can be taken out. The tile are set two high and in case the clay is stiff they may be set three high.

Each day we run one size of tile until ten o'clock, another size until twelve, and so on until the shed is full. In taking them to the kiln we must have all the sizes so as to nest them. With fair weather it takes from ten to fourteen days to dry them. Last season we had some in the shed for months that would not dry; they had to pass, however, and we took them to the kiln. We have racks made of strips and set two rows on top of each other, then they are taken to the track and from there into the kiln. We take two cars at once and by the time these are unloaded the other cars are loaded. The empty racks are taken back to the shed and the full one to the kiln. Our kiln has a capacity of 70,000 to 80,000. (Applause.)

Pesident Sanborn: We will now listen to a paper by Mr. Weidman, State Geologist, of Madison, who will talk on the "Origin and Distribution of Clays in Wisconsin."

ORIGIN AND DISTRIBUTION OF CERTAIN CLAYS IN WISCONSIN.

Mr. President and Gentlemen of the Convention:

In discussing my subject I wish merely to refer very briefly to the general origin and distribution of Wisconsin clays. This subject has been quite fully discussed by E. R. Buckley in his report on the clays of this State, which report I presume most of you have seen, and if you have not, a copy can readily be supplied to you.

I wish especially to discuss in some detail the origin and distribution of certain clays of the central part of the State, but before taking up my detailed subject, I will discuss briefly the various classes of clays which we have.

The most abundant clays are those closely related in origin and distribution to the glacial deposits of the State. These deposits were formed during the glacial period and originated in various ways, either by direct work of ice and water combined, or by lakes and streams associated with the ice fields, but located at various distances from them. An extensive type of these clays are the lake deposits laid down during the former extension of lakes Michigan and Superior, and now usually found at some distance from the present lake shore. Around Racine they occur 18 miles inland, distributed over the eastern half of Kenosha and Racine counties and nearly the whole of Milwaukee county. Farther north along Lake Michigan, they occur over a belt varying from a few miles to 12 or 15 miles in width, in the eastern part of Sheboygan, Manitowoc and Kewaunee counties, and over the whole of Door county. Along Green Bay, the lower Fox river and Lake Winnebago these deposits are abundant. Along Lake Superior, in Douglass, Bayfield and Ashland counties, they occur in a belt extending inland from 10 to 20 miles. These lake deposits have a maximum thickness along Lake Michigan of 150 feet, and are even thicker along Lake Superior. The upper beds of these lake clays are reddish brown, while the lower beds are often dull pink. These clays usually burn to cream colored brick and are worked extensively for brick and tile at Green Bay, Depere, Manitowoc, Milwaukee and Racine.

Another variety of clay deposits very similar in character to the lake deposit just described are the clays found along the Fox, Wolf, Rock, Wisconsin, Eau Claire, Chippewa, Black, Cedar, Red and many other rivers of the State. These clays are more variable in their composition, especially with respect to lime, than the lake deposits. This may be on account of the slight difference in origin, for the latter deposits are generally believed to have been formed by the work of rivers flowing into the estuaries or bays of Lake Michigan when it was very much larger than at present.

The deposits in the river valleys in the southwestern part of the State where there are no glacial deposits, as well as those deposits in glaciated regions where limestone occurs, are very calcareous. In those parts of the State where limestone is not prsent, the clays are but slightly calcareous.

In Dunn and St. Croix counties are considerable quantities of kaolin, which is believed to have been derived from the decomposed crystalline rocks that occur to the northeast. These white clays occur with layers of sand and usually lie beneath some boulders and glacial till. The white kaolin clays are used extensively as paper clays. The principal deposit of this clay now being worked is located at Hersey, St. Croix county.

S. Weidman, Madison, Wis.

Throughout the drift region of the State, in the regions where the Potsdam sandstone or the crystalline rocks form the underlying rock, are clay deposits of variable extent, often from 40 to 50 feet thick. These purely glacial clays are worked at Antigo, Edgar, Barronette, Chippewa Falls, Menomonee, Marshfield, River Falls, Tomahawk and Wausau. These clays are very variable in character and constitute some of the best as well as some of the poorest clays in the State.

Interstratified with hard rocks of the sandstone and limestone formations are beds of shale from 7 to 10 feet thick, which furnishes good clays in various parts of the State. Shales of the Potsdam sandstone occur at Merillan, Durand, Black River Falls, Eau Claire, Neillsville and Fond du Lac. At the present time these shales are not being worked in the eastern part of the State the Cincinnati shale formation occurs and is worked for brick and tile in two localities, at Oakfield, Fond du Lac county and at Stockbridge, Calumet county. While the Potsdam shales are almost free from lime and magnesia, the Cincinnati shale is very high in these constituents, and therefore can very probably be used only in common brick and tile making.

The next class of clays occurring in this State, the ones which I wish to describe in some detail, are the clays formed through the decomposition of the crystalline rocks and classed as residual clays. These clays are being worked at the present time in at least four different places in the State, viz: Black River Falls, Grand Rapids, Stevens Point and Ringle. At numerous other regions in the region of these deposits there are similar deposits of clay of sufficient extent and of proper quality for the manufacture of clay products.

In Dr. Buckley's report on The Clays and Clay Industries of Wisconsin these deposits are referred to as the clays of the pre-Cambrian shales. To be exact, these clays are decomposed crystalline rocks of various kinds and generally include rocks of igneous origin rather than those of sedimentary origin like shale. These clay deposits overlie the hard, crystalline rock and have originated from the crystalline rocks beneath by the weathering in place of the granite, schists, green stone, trap rocks, etc. Starting from the top, the deposits are usually soft and frequently almost completely kaolinized, resulting sometimes in a clay which is nearly white. Deeper down, the rocks are less and less altered until the clay gives place to the partially decomposed rock and then finally to the hard crystalline rock. AA gradations between the clay and hard rock, therefore, occur, showing the former to be but the weathered product of the crystalline rock.

These deposits vary in thickness from 10 to 40 feet and are found in that portion of Central Wisconsin where there is but a thin capping of the Potsdam sandstone overlying the pre-Cambrian crystallines. This region where the thin sandstone and crystalline rocks are associated extends in an irregular belt of considerable and greatly variable width from the eastern part of Marathon county through the vicinity of Stevens Point, Grand Rapids, Neillsville, Black River Falls, Eau Claire and Chippewa Falls.

The distribution of these deposits, as already stated, is in the region where the sandstone and crystalline rocks occur, that is, along the border of the crystalline and sandstone district. It was the belief of Prof. Irving, of the Geological Survey of 1870 to 1880, that these clays were formed in some manner after the sandstone was deposited upon them, and Dr. Buckley in his recent report, was of the opinion that the present rivers had much to do with their origin. During the past few years I have been occupied with the geological survey of Central Wisconsin, including the area of Clark, Wood, Portage and Marathon counties, where these residual deposits of clay occur, and they were found, as shown by well records, to be quite generally distributed beneath the sandstone, and closely adjacent to the sandstone, and not more or less abundant near the rivers and streams than elsewhere. Farther north, where the crystalline rocks are abundant surface rocks, and where the sandstone formation is no longer present but has been removed by erosion, the clays are likewise gone, having been undoubtedly removed by similar erosion. Farther south where the sandstone covers the region completely, these clays are found beneath great thicknesses of the sandstone, as indicated by well records. In fact, the distribution of these clays is such as to indicate that their origin has nothing to do with the present rivers, but that they were formed ages ago, far back in the pre-Cambrian time and thus long before the present rivers were located where they now occur, and even long before the Potsdam sandstone was deposited over the region. In other words, the most rational explanation of the distribution of these residual clay deposits, and the one that is in all respects fully explanatory of their occurrence, is that they were formed through the extensive weathering of the crystalline rocks before the Potsdam sandstone period, and that later the sandstone was deposited upon them, and hence these sandstone beds now serve in many places to protect them from the present work of erosion.

President-elect G. W. Kennedy, Manitowoc, Wis.

There is other geological data also going to show that these residual clays were formed in the very remote period before the deposition of the sandstone formation. This, however, need not be discussed here. It need only be mentioned that the crystalline rocks were essentially flat lying and that the conditions were present for the extensive weathering of the crystalline rocks without removal by erosion for a long time before the incoming of the sea, in which was deposited the sandstone of the region.

The fact, therefore, that these residual clays form weathered crystalline rock are older than the sandstone and that the latter were later deposited upon them shows that these clays have a widespread distribution beneath the sandstone. Along the border of the crystalline and the sandstone districts, therefore, where the sandstone is neither too thick nor where its protective covering has not been removed by too wide an area, these clays occur. We need not confine our search for them along the rivers and streams. They should be looked for everywhere in the flat ground between the low patches of sandstone and also beneath these thin cappings of sandstone themselves. The thickness of these deposits is very irregular in adjacent vicinities and varies from a few feet to 30 or 40 feet. As already inferred, these residual deposits are an approximately horizontal formation of irregular thickness beneath the sandstone and should be searched for along the borders of the crystalline and sandstone districts, from the region where sandstone is not too continuous and too thick to prevent economical working, to the region of the crystalline rocks where ledges of sandstone are scarce and which serve as a protective covering for these deposits.

Clay is derived from the decomposition of crystalline rocks similar to these of Central Wisconsin include the highest grades of clay found in this country, and are those used in the manufacture of porcelain, white earthenware, and other white-burning material. Clays of this nature occur in the region of the crystalline rocks of the Appalachian mountains, from Massachusetts to Alabama. Important deposits occur in Maryland, Delaware, Pennsylvania and North Carolina.

In Maryland, in Cecil county, are deposits of these clays which are worked, the kaolin being used in paper manufacture, and in Howard county the clay is sold in its crude condition for the manufacture of refractory brick. In Delaware, at Hockessen and Newark, kaolin is worked from residual clays formed through the decomposition of coarse granite or pegmatite veins. In Pennsylvania, in the vicinity of Brandywine Summit, where the feldspar mines occur, considerable deposits of kaolin, due to the decomposition of the feldspar veins, is also found. Kaolin from these Pennsylvania deposits is used in the manufacture of silica brick and pottery. In North Carolina are extensive deposits which are used for the manufacture of common brick, semi-refractory brick, and in places the deposits are worked and the kaolin used for the manufacture of white earthenware.

The character of these residual clays in Wisconsin is such as to warrant their thorough investigation, with the hope that deposits may be found from which something more than common brick and tile can be made. Compared with the other clays of the State they are higher in alumina and alkalies. They are also likely to contain in places more or less iron. They contain a variable but usually not large amount of lime and magnesia and are almost entirely, if not quite, free from carbonate. Kaolin is very generally abundant and also usually considerably quartz. We should expect, therefore, to find among these residual clays some deposits suitable for the manufacture of paving brick and fire brick, and also white ware, and as a rule all of them should make good common brick and tile.

As already stated, these residual deposits are being worked at four places, viz: at Black River Falls, Grand Rapids, Stevens Point, and Ringle. At Black River Falls dry press brick and tile are made, at Grand Rapids and Ringle soft mud brick, and at Stevens Point stiff mud brick. Certain phases of the Stevens Point brick are now used to considerable extent for fire brick. It is in the clay deposits of this character and origin also, that we expect to find deposits of washable kaolin. In fact, deposits of this nature at Grand Rapids were known long ago to furnish kaolin, though not in sufficient abundance to be of value. (Applause.)

GENERAL DISCUSSION.

President Sanborn: I think we owe Prof. Weidman a vote of thanks for this paper, and all those in favor of extending a vote of thanks manifest by rising.

A vote of thanks was extended unanimously.

Mr. Weidman: I hardly think my paper is worthy of more manifestation than other papers.

President Sanborn: I am sure that your paper is appreciated by all the members of this association very much.

Mr. Weidman: I might add a few words. I especially referred to this kind of clay as being our coarsest grade of clay. I might announce at this time that the Geological Survey has requested the services of two men to investigate this work during the coming summer, and the object of their work will be to investigate this clay. Prof. Reis is probably better qualified to investigate our clay than any man in this country. He has made detailed reports of the clays in Alabama, Maryland, North Carolina, Michigan, California and also in Louisiana, and has prepared general reports on all States and of the clay industry in New York. I hope next year that Prof. Reis will be with you and will be able to give you something of definite value along this line of work.

Secretary Bright: If there is nothing further to be said on this paper we will take up the last paper on the program, entitled, "Comparing Wisconsin Brick Industry With Other States," by the President.

COMPARING WISCONSIN BRICK INDUSTRY WITH OTHER STATES.

Mr. President and Gentlemen of the Convention:

A glance at the map prepared by Prof. Buckley showing the clay deposits of Wisconsin, reminds us that Wisconsin is rich in brick clays and that she will not be lacking for brick material for ages to come.

I think you will bear me out in saying that there is no State that produces a better quality of common brick than is produced in Wisconsin; we certainly have reason to feel proud of our product in this State.

The following statistics of the several States we have obtained from the Interior Department which may be of interest to us in comparing the brick industry of Wisconsin with that of other States:

The output of common brick in Illinois in 1898 was 573,450,000; in 1902, 1,023,681,000; being an increase in the four years of 56 per cent.

The output in Michigan for the year 1898 was 163,490,000; for 1902, 238,254,000; being an increase of 45 per cent.

The output of Minnesota for the year 1898 was 128,327,000; for 1902, 180,035,000; being an increase of 41 per cent.

The output in Indiana for the year 1898 was 298,954,000; for 1902, 305,233,000; being an increase of 35 per cent.

The output in Iowa for the year 1898 was 198,417,000; for 1902, 228,142,000; being an increase of 15 per cent.

The output of Wisconsin for the year 1898 was 142,767,000; for 1902, 152,127,000; being an increase of 6.5 per cent.

While all these States show an increase in the production of common brick during this period they do not all show an increase in the production of pressed brick.

Michigan heads the list with an increase of 41 per cent; Indiana increases her product 39.75 per cent; Minnesota 35 per cent and Iowa 8.9 per cent; while Illinois shows a loss of 8.9 per cent and Wicsonsin 8.3 per cent.

Some of the other States have an advantage over Wisconsin in the manufacture of paving and fire brick. So far as I have been able to learn no clays have been found in this State from which either of these kinds of brick can be successfully manufactured.

In 1902 Illinois manufactured 91,116,000 paving brick: Indiana, 45,533,000 and Iowa 23,905,000. The amount manufactured in Michigan is not reported, while none were manufactured in Minnesota or Wisconsin.

Regarding the output of fire brick for the same year in these States the value of the product manufactured in Iowa was $850; in Indiana, $66,725; in Illinois, $199,048; while none are reported from Minnesota, Michigan or Wisconsin.

As to the rank of States in the manufacture of brick and tile products, Illinois ranks 4; Indiana, 6; Iowa, 8; Minnesota, 14; Michigan, 16, and Wisconsin, 22.

There are several reasons why the brick industry has not advanced as rapidly in Wisconsin during the past few years as in other States: Lumber has been cheaper here than in several of the adjacent States and in some parts of Wisconsin it has become quite a fad to build dwellings of wood instead of brick, as they can paint them to look more artistic, they claim, than a brick building; losing sight of the fact that the cost of insurance and maintenance of a wooden building is very much greater than that of a brick building.

The shipping of brick into Wisconsin from Chicago also has a tendency to curtail the production of common brick, especially in the southern and eastern parts of the State.

It seems that the railroads are giving Chicago brick manufacturers rates on brick to points in Wisconsin that are much below the rates that they give to Wisconsin brick manufacturers from the same points to Chicago, which, of course, is very detrimental to the interests of the brickmakers of this State who are obliged to compete with these brick. There ought to be some way whereby this injustice to our brickmakers could be righted, but I am unable to say how it shall be done until we have an interstate commerce law that will govern the railroads and compel them to deal fairly by all shippers, which is a very difficult proposition so long as railroads influence legislation as much as they do at the present time.

While the demand for brick has not increased as rapidly in Wisconsin as in other States which we have used in comparison, yet we have no doubt that the next decade will record a much larger per cent. of increase than the last. As other building material increases in price they will use more brick.

The quantity of brick we manufacture is not of more importance than the price we receive for the same. Our profits certainly should be much larger than those of other industries that are operated continually.

In comparing the price of our brick with those of the other States we find the average price of common brick as follows: Iowa, $6.91; Wisconsin, $6.05; Minnesota, $5.71; Michigan, $5.61; Indiana, $5.60, and Illinois, $5.01.

From this it will be seen that only one of these States is averaging as good a price as Wisconsin and I think that in that State fuel is so much more expensive that our profit is equal to theirs.

In many cases it is more satisfactory to the brick manufacturer to produce a smaller quantity at a good profit than a larger quantity at a small profit.

While we have reason to feel proud of the quality of our product it certainly is to our interest to spare no expense to the end that we manufacture only the very best quality possible, as architects and builders these days are looking for the best.

We need a system of burning that will give us a larger per cent. of hard brick that is not too expensive for smaller plants to install. I think that Wisconsin clay will stand more fire than the clay found in any of the adjoining States, consequently it is more of a problem with us than with them. Who will be the man to solve this problem for us? (Applause.)

President Sanborn: We will now listen to report from Committee on Nominations.

Mr. Hamilton: The committee on next place of meeting and nominations reports as follows:

1. Recommended that the next meeting place be at Manitowoc, Wis., and
2. That it be left to the President and Secretary to fix the time and dates of meeting.

Vice-President-elect A. W. Hilker, Racine, Wis.

3. We nominate the following officers for the ensuing year:

President—G. W. Kennedy, Manitowoc, Wis.
Vice-President—A. W. Hilker, Racine, Wis.
Secretary—F. Vogt, Milwaukee, Wis.
Treasurer—Oscar Zimball, Sheboygan, Wis.

(Signed) J. G. Hamilton,
J. W. Hinkley,
W. M. Ellis,
Committee.

It was moved and seconded that the Secretary be instructed to cast a unanimous vote of the association for these officers.

The vote being so cast, the President announced these gentlemen elected for the ensuing year.

President Sanborn: We would now like to hear from the officers-elect. Mr. Kennedy has just been elected President of this association. We would like to hear from him.

Mr. Kennedy: I am a good deal like the boy when he comes out to say his piece. He says, "I forgot." It is customary for everybody, when they are asked to say anything, to say, "I did not expect to say anything."

Now, you have selected me as President of this association and I don't think you have done the association justice. There are men here much better qualified, who know more about brick than I do.

I am glad you are coming to Manitowoc, and assure you that we will do our best to entertain you.

Now, there is one thing about the election of officers. To each and every brick worker in Wisconsin the association means

(Continued on page 394.)

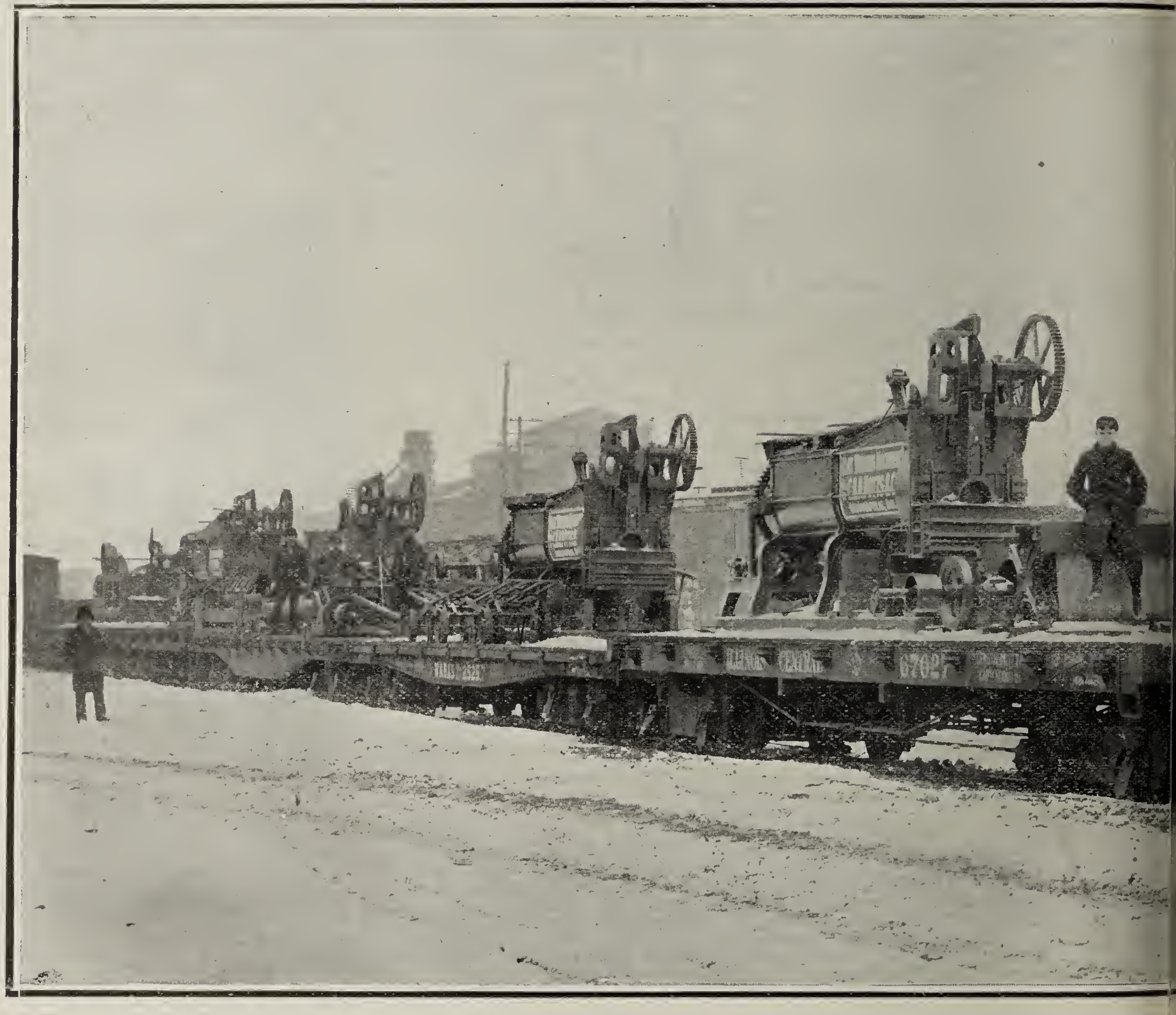
PROSPERITY.

THE accompanying picture shows one shipment of six cars, made February 23, 1904, by C. & A. Potts & Co., of Indianapolis, each containing a Potts horizontal brick machine disintegrator. The above shipment being distributed to various points in Wisconsin, two more cars followed March 1 to this same State, as well as numerous others to New York, California, Texas and Mississippi.

Messrs. C. and A. Potts inform us that the demand for their machinery has taxed their large and complete plant to the limit the last year. This machinery is so well known and thoroughly distributed in every State that it does not require an army of salesmen on the road at an enormous expense to sell the same. Securing the business as they do, saving this great expense, they are enabled to offer the trade a better grade of machinery at fair prices. Every machine put out is a standing advertisement for them, and many of their sales are traced to the influence of those already in use.

The all-iron horizontal machine is built entirely of iron and steel, the gear being of cast steel, which is an unusual thing in any class of machinery. While these steel castings are much more expensive, they consider it good business policy to give their customers the very best material in a machine that is possible to purchase, giving gear which cannot be broken by any unusual strain which may be thrown upon them.

In the construction of this machine they use none but skilled mechanics and the most modern tools. The castings are unusually heavy, and wherever two castings are bolted together the surfaces are planed true and square, insuring a solid and durable machine, one which can be run at a high rate of speed and cause no annoyance or delays from the various parts working loose or breaking.



A Train Load of Potts Brick Machinery

The demand for the well-known Potts disintegrator is as great as ever. They have continually improved this machine, so that it is now as near perfect as a piece of machinery can be, increasing the size of shafts and adopting ring oiling bearings, making an easy running machine and one that will give no trouble from hot journals. Their aim has been to build the best possible machine, and not to see how cheap it could be built and placed upon the market. The great demand for these machines under present conditions justifies their effort in this line.

The Potts Mould Sander still appears to be the leader in this line, the demand increasing each year. It is the simplest machine ever designed for this work and gives their customers entire satisfaction.

Messrs. C. & A. Potts & Co., whose ads appear on pages 448-449, will be pleased to give any further information desired.

AN UNDEVELOPED BRICK FIELD.

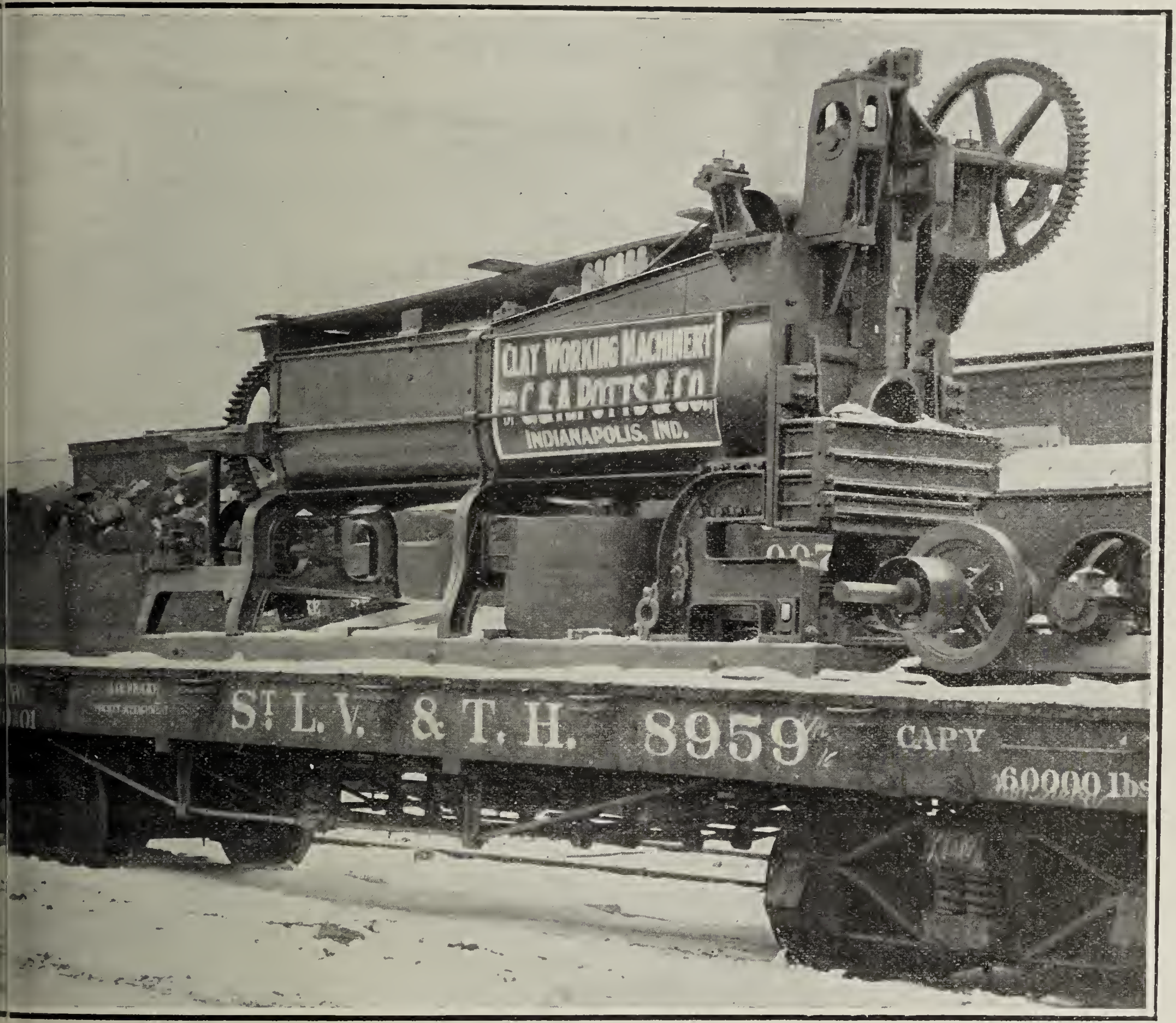
Mr. George B. Richardson, the author of geologic folio No. 102, on the Indiana (Pa.) quadrangle, recently published by the United States Geological Survey, calls attention to deposits of clay and shale in that area that might be used for the manufacture of paving bricks and many other articles for which clay is necessary.

Brickmaking material is widely distributed in the Indiana quadrangle, but it has not received much attention. It consists of shale and fire clay. These are of sedimentary origin and are composed of fine-textured, more or less decomposed rock fragments.

The deposits of shale are homogeneous, fine-textured and of widespread occurrence. They are not utilized except on a small scale for the manufacture of building bricks in the town of Indiana, nor have they been well tested, but they seem to offer a field worthy of investigation. In conjunction with associated beds of limestone these shales might also be used in the manufacture of cement.

No attempts have been made to utilize the fire clay in the Indiana quadrangle. Several beds of fire clay occur in the Allegheny formation, the most important horizons being a few feet below the Upper Freeport coal and below the Lower Kittanning coal.

This folio may be obtained for the sum of twenty-five cents on application to the Director of the United States Geological Survey Washington, D. C.



hipped to Points in Wisconsin.

Humor of a Strike.

Two strikers were picketing the entrance of an alley during the strike at the factory of the Kellogg Switchboard and Supply Company in Chicago last May. A non-union man came out of the factory and started across the street. One of the strikers picked up a brick. As he looked at it an expression of disgust came over his face and he threw it down.

"Why didn't you throw it at that scab?" asked the other striker.

"Beause it is a non-union brick."—*World's Work.*

THE WISCONSIN CLAYWORKERS' ASSOCIATION.

(Continued from page 391.)

more to each member than the member means to the association. I do not care who you put in for officers, they cannot do anything unless you work with them. The Secretary last year did his work thoroughly; so did our President, but we all need to lend our assistance. Now we must all pull together each year, and we will then have a better time and get better acquainted.

I thank you for the distinguished consideration shown me, and promise to do my best. (Applause.)

President Sanborn: We will now listen to our Vice-President-elect.

Mr. Hilker: I thank you very much for the honor you have conferred upon me. I have one consolation, and that is this, that I am only the fifth-wheel of the wagon. That means that I will not have to act unless one of the other four wheels should get out of order, in which case I should be glad to render my very best service. Again I wish to thank you for the honor.

Mr. Vogt, Secretary-elect: I hope that I will have more to say at the expiration of my time. All I can say now is that I feel honored to be elected Secretary, and I will use my best efforts to the advancement of the association. Gentlemen, I thank you.

Mr. Zimball, Treasurer-elect: All I can say at the present time is to thank the members and promise to keep safe and secure the funds of the association which are entrusted to my care.

President Sanborn: Is there any further business to be brought before this meeting?

Treasurer-elect Oscar Zimball, Sheboygan, Wis.

Mr. Hilker: Mr. President—It seems to me that we certainly at this convention ought to do something in regard to the freight rates. There certainly is an injustice done to the brick shippers in the State of Wisconsin. For an example, a few weeks ago I had an occasion to figure on a job in a small village about five miles south of Racine. It was a place where they raise a good deal of cabbage, and if you had all been in the cabbage business this year I am sure you would have made money. I called upon the Northwestern people, which was the road that goes to that place, and asked them what the rate would be by car-load lots. I told them I would have to have the best rates. The best they could do was 3 cents. Now, our rate from Racine to Chicago is 3 cents. Now, that hardly seems fair. Of course, the Illinois people are sending quite a lot of brick into the State of Wisconsin. At the present time I understand the price of brick in Chicago is $6.50. Why, you can buy Chicago brick at Racine for $5.00. Either the railroad company is donating its services to those people or there is something in the fence. The railroad people have admitted to me that they are doing something, but what I cannot find out. Now, I think that at this session we ought to do something in regard to rates.

Mr. Chase: I think that the question of rates ought to be left to the Executive Committee. I think they will come together oftener than any other committee would, and it would be right in their line. I think they are all competent to give us good service in that work, and I would make a motion that the question of rates be left to the Executive Committee.

Mr. Randall: I will introduce a resolution to the effect that the railroad officials be appealed to in the name of equity and justice to afford such facilities and impartial rates as shall insure an amicable business arrangement in this connection. I make this as a motion.

President Sanborn: As chairman of the Committee on the Standard Size of Brick, I submit the following for your consideration:

REPORT OF COMMITTEE ON STANDARD SIZE OF BRICK.

Members of the Wisconsin Clayworkers' Convention:

Your committee appointed at last meet meeting of this Association to take up the matter of adopting a standard size of brick, with the brick manufacturers of Wisconsin, beg leave to report as follows: We have sent out circular letters to 100 brick manufacturers of the State and received replies from 40 who are unanimously in favor of adopting a standard size. 27 of this number are in favor of adopting the Chicago size: 8x3⅞x2¼; while the other 13 were in favor of adopting sizes ranging from 7¾x4x2 to 8¾x4¼x2 9-16. We therefore recommend that 8x3⅞x2¼ be adopted as a standard size for hard-burned, common brick, as this practically the size adopted by the National Association.

Respectfully submitted,
F. L. Sanborn,
J. S. Fifield,
E. W. Drake,
Committee.

Moved and carried that this report be adopted.

President Sanborn: We will now hear the report of the Committee on Resolutions, of which Mr. George Hartwell is Chairman.

—Report of Committee on Resolutions—

Resolved, That the fourth annual meeting of the Wisconsin Clayworkers' Association, though less in number, owing to the illness and detention of several of its members, has been distinctly along the lines of progress; the papers presented being of a high character.

Resolved, That this convention express its unanimous appretion to the contributors of the papers.

Resolved, That the thanks of this association be tendered to Messrs. Sanborn and Affeldt, our hosts, and to all those who have contributed to our enjoyment of Portage hospitality.

Resolved, That thanks be extended to the several committees—the Executive and Finance, the Reception and Program Committees—for their faithful performance of their duties.

Resolved, That every member here in attendance shall foster the increase of membership of our association by personal communication with our fellow-craftsmen, either by word or by letter.

Resolved, That the retiring officers be congratulated upon the efficient manner in which they have filled their respective positions, and that the thanks of this association be tendered to them.

Resolved, That this convention express its unanimous appreciation of cordiality shown by the Honorable Mayor J. E. Jones, and that at the conclusion of the session the keys of the city be returned to him with thanks, also the police station intact.

George H. Hartwell, Chairman,
Arthur Duerrwaechter,
H. De Joannis.

President Sanborn: I wish to say in behalf of Mr. Affeldt and myself that I am sure you have not enjoyed this session any more than we have. We have done what we could to make your presence in this city pleasant. We shall be glad to welcome you here at any time again, I can assure you.

The next thing on the program will be a banquet to be held at the Emder House at 8:30 this evening. The presence of all is desired.

On motion the convention adjourned.

LIST OF MEMBERS.

W. H. Carter	Appleton, Wis.
W. E. Johnson	Augusta, Wis.
G. C. Stoll	Bucyrus, O.
C. S. Morris	Berlin, Wis.
B. H. Bright	Black River Falls, Wis.
H. A. Nelson	Bristol, Wis.
William Meadows	Burlington, Wis.
E. R. Frazier	Chicago, Ill.
H. S. Hopkins	Chicago, Ill.
J. J. Moroney	Chicago, Ill.
G. H. Hartwell	Chicago, Ill.
B. E. LaDow	Chicago, Ill.
H. De Joannis	Chicago, Ill.
F. S. Kenfield	Chicago, Ill.
Wm. Padget	Chicago, Ill.
F. E. Swift	Cincinnati, O.
J. B. Theriault	Chippewa Falls, Wis.
C. F. Coleman	Eagle River, Wis.
Loveland & Wade	Elroy, Wis.
Royal Parr	Edgerton, Wis.
W. M. Ellis	Endeavor, Wis.
Geo. F. Thomson	Eau Claire, Wis.
H. G. Hass	Fond du Lac, Wis.
W. L. Haumerson	Fort Atkinson, Wis.
J. G. Hamilton	Grand Rapids, Wis.
J. W. Hinckley	Green Bay, Wis.
Wm. E. Finnegan	Green Bay, Wis.
Syme, Baldwin & Co	Glenwood, Wis.
C. & A. Potts & Co	Indianapolis, Ind.
T. A. Randall	Indianapolis, Ind.
J. C. Walsh	Janesville, Wis.
J. S. Fifield	Janesville, Wis.
Kemmeter Bros.	Jefferson, Wis.
F. E. Dickenson	Kendallville, Ind.
C. Brockenhauser	Kenosha, Wis.
T. Chas. Tyson	Kenosha, Wis.
Ed. Fricke	Manitowoc, Wis.
Stephen Bertler	Manitowoc, Wis.
G. W. Kennedy	Manitowoc, Wis.
A. D. Stevens	Madison, Wis.
D. Stevens	Madison, Wis.
S. Weidman	Madison, Wis.
Lions, Reese & Lions	Marshfield, Wis.
C. W. Brownrigg	Merrimac, Wis.
Oscar Wilson	Menomonee, Wis.
Emil Kraatz	Milwaukee, Wis.
P. L. Youngren	Milwaukee, Wis.
Clifford Chase	Milwaukee, Wis.
M. Devaaler	Milwaukee, Wis.
G. J. Schwarz	Milwaukee, Wis.
E. W. Drake	Milwaukee, Wis.
J. Q. Burnham	Milwaukee, Wis.
Chas. Burnham	Milwaukee, Wis.
J. D. Rowland	Milwaukee, Wis.
F. Vogt	Milwaukee, Wis.
O. H. Zielsdorf	Milwaukee, Wis.
F. Freese	Monroe, Wis.
Ed. Brevoid	New Richmond, Wis.
Zerrener Bros.	New London, Wis.
F. L. Sanborn	Portage, Wis.
H. C. Affeldt	Portage, Wis.
F. Gunther	Port Washington, Wis.
S. Gunther	Port Washington, Wis.
Otto Krauss	Plymouth, Wis.
Wm. Baumann	Racine, Wis.
Hilker Bros.	Racine, Wis.
H. A. Block	Rockford, Ill.
Wm. Schmahl	Rockford, Ill.
E. R. Buckley	Rolla, Mo.
H. Halverson	Sheboygan, Wis.
C. Froelich	Sheboygan, Wis.
Oscar Zimball	Sheboygan, Wis.
A. Klemme	Sheboygan, Wis.
Jacob Ramaker	Sheboygan Falls, Wis.
A. Duerwechter	South Germantown, Wis.
W. E. Jeannot	St. Paul, Minn.
H. Brewer & Co	Tecumseh, Mich.
C. D. Henrichs	Tomah, Wis.
J. H. Duke	Tomahawk, Wis.
J. Ringle	Wausau, Wis.
F. F. Weshner	Wautoma, Wis.
L. H. Cordes	Watertown, Wis.
Ben Truber	Wonowoc, Wis.

THE WISCONSIN CLAYWORKERS AT BANQUET.

All who attended the Wisconsin convention at Portage enjoyed most thoroughly the social function, or banquet, Wednesday evening. It was quite informal, and really all the more enjoyable for being so. President Sanborn officiated as toastmaster in a most gracious manner, introducing the speakers of the evening in such a modest, kindly way as to make them feel thoroughly at home and enable those not accustomed to after-dinner speaking to respond cleverly. There were no set speeches, but a number of informal talks interspersed with bright stories. All in all it was a very enjoyable evening, and those who participated voted to a man that, Providence permitting, they would be present at the next annual meeting, which is to be held at Manitowoc.

Written for The Clay-Worker.

ST. LOUIS BRICK AND BUILDING NEWS.

World's Fair Notes.

AS SOON AS SPRING weather commenced to appear, a few days ago, a revival of building commenced, numerous permits for new structures have recently been issued, indicating that builders are preparing to meet the demand for dwellings, flats and accommodations for transients during the coming summer. Not only are temporary structures engaging the attention of the builders at present, but the larger number of permits issued lately have been for permanent buildings.

The rapidity with which buildings have been erected during the past year, shows that permanent structures still may be completed between now and the opening of the World's Fair.

Many, however, will take advantage of the fact that the latter part of the Fair will be the most popular, as demonstrated by previous large expositions, and will continue building operations up to the middle of summer.

Many permits issued from the office of the building commissioners recently, were for flats, which are so much in demand at present, and which can be rented almost as soon as the locations are selected.

A number of substantial dwellings are also included in the list. Numerous hotels of various styles, some of them to be quite pretentious edifices, are among the projects developed.

Many large houses are to be remodeled and added to, fitting them for the hotel business during the Fair.

Several temporary hotel enterprises of considerable proportions were started quite recently.

In the business sections, some large business enterprises are under way. One is an entire block that is being improved with a large factory and warehouse structures.

The monthly report of the building commissioner, for February shows that while much less has been expended for brick buildings than there was during February, 1903, the amount for frame buildings has greatly increased. This is due to the large number of World's Fair hotels and concessions permits, which were issued last month. In February, 1903, there were eighty-three permits for brick buildings to cost $690,229 issued During the past month sixty-seven permits were issued for brick buildings to cost $469,465. There were 111 permits issued in February, 1903, for frame buildings to cost $26,275, and 120 permits for frame buildings to cost $318,970, during the month just ended. The totals are: February, 1903, $716,504; February, 1904, $788.435.

Many valuable geological products of Pennsylvania will be shown in the archways erected for entrances to that state's section, at the World's Fair. These will include building stone, cement, terra cotta, etc. The sands, clays, etc., of the state will also be shown.

While ascending a ladder in a clay mine at Pierce and West Park avenues, recently, a clay miner slipped and fell to the bottom of the shaft, a distance of seventy-five feet.

The Alton, (Ill.) Paving, Building & Fire Brick Company resumed operations a few days ago, after a shut-down of several weeks, during which improvements amounting to several thousands of dollars were made.

Mr. Anthony Ittner, of the Ittner Brick Company, says that business is gradually getting better. He has had many inquiries for brick and has closed a number of big orders.

There has been no change in the prices of brick. Merchantable brick is still quoted at $7.50, strictly hard and red, at $8.25; ordinary hard and red, $8.00; front red and stock, $18.00, and sidewalk and paving, $10.00

The Evens-Howard Fire Clay Company, report quite a good trade, and they are quite busy.

The Christy Fire Clay Company have been busy right along, in spite of the weather and are making improvements to their plant all the time.

A. SAINT.

The Anthony Ittner Brick Co., of Belleville, Ill., is installing a forced draft outfit purchased from the American Blower Co. of Detroit. The apparatus consists of a 90-inch three-quarter housed fan, operated by an independent "A B C" engine, having a cylinder 9 inches in diameter, and a 7-inch stroke. This outfit is designed to furnish air for the combustion of 3,100 pounds of coal per hour.

HORTON'S WRITE UP.

THE BOOM in business for the past three years has probably been greater in the brickmaking industry than in any other branch, and consequently the demand for brickmaking machinery has correspondingly increased, especially in the higher grades.

The Horton Manufacturing Company of Painesville, Ohio, has enjoyed its share of prosperity and the increased demand for its machinery has made it necessary that the company have more room and better facilities in order to meet the growing demands of its trade.

Although the company occupied a very commodious shop, it has now erected a factory large enough to allow it to branch out, and to keep up with the rush of orders during the busy seasons.

The new plant is well located, having a private railroad siding running directly into the works, and connected with three trunk lines, viz: The L. S. & M. S. Ry., the B. & O. Railroad, and the N. Y. C. & St. L. Railroad, thus enabling the company to get for its customers the lowest possible freight rates. The railroad facilities and the geographical location gives opportunity for getting raw material at the lowest prices, hence the company can make its customers low rates on all finished goods.

Pig iron, steel bars, etc., are manufactured within fifty miles of Painesville. Northern Ohio has the finest of cherry, black walnut and oak lumber, and coal is abundant at even less distance than iron.

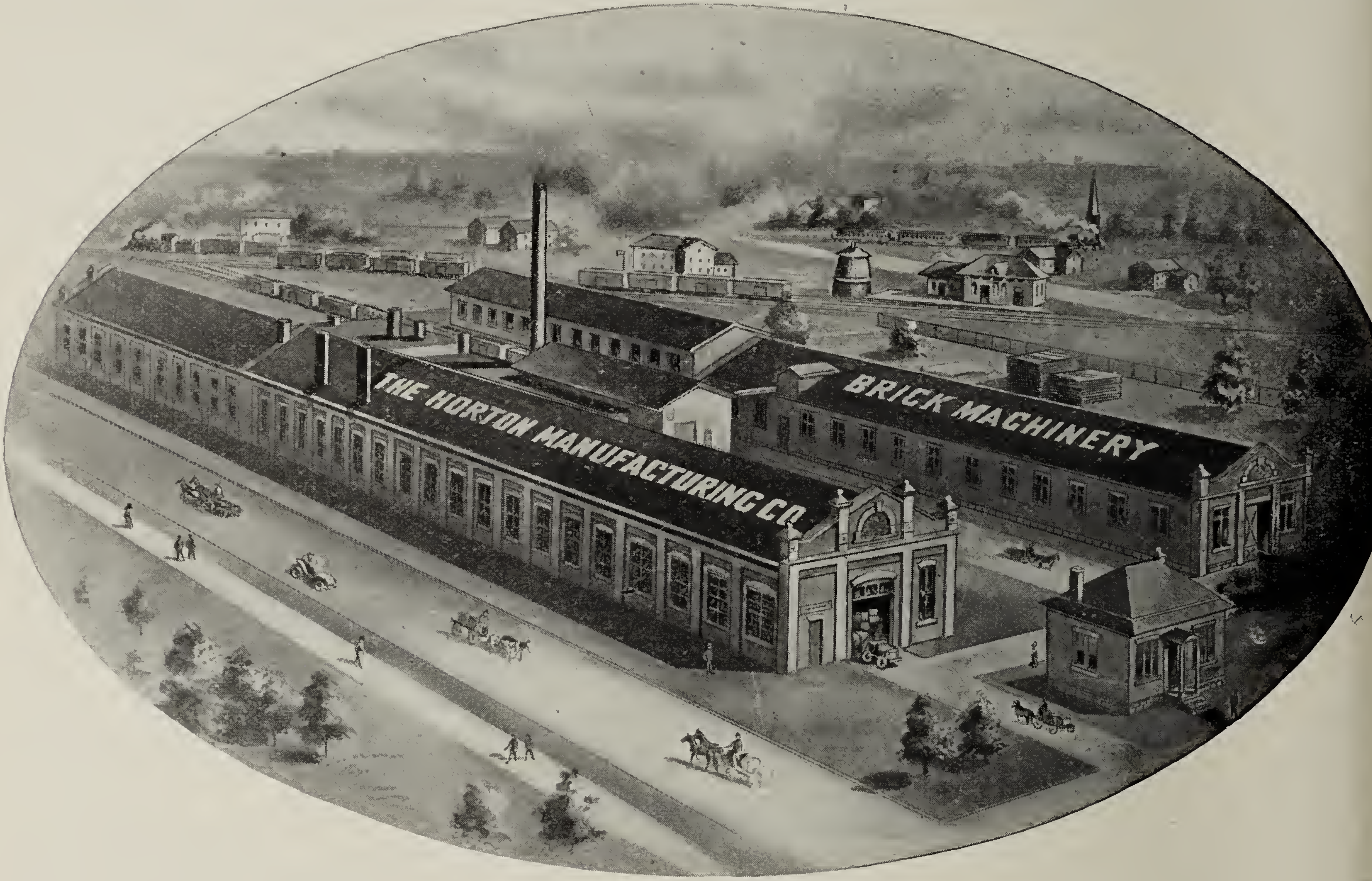
The plant covers over three acres of land, and the buildings, which are practically fireproof, are equipped with modern machinery, cranes, etc., and are lighted by electricity. The machine shop, foundry, cupola room, and pattern vault are built of brick, with German tile roof, and with the exception of the foundry, have cement floors. The wood shop, warehouse and lumber sheds are covered with iron, and have tile and slate roofs. The machinery is driven by a large Corliss engine, the exhaust steam of which is used to heat the buildings.

The business was established in 1895 by C. H. Horton, the president of the company, who has spent nearly his entire business life as an expert in designing and manufacturing clay-working machinery, and who has made a specialty of machines for handling soft mud. The Standard brick machine, which the company first put upon the market, met with success from the start. The Hercules machine was also introduced about the same time, and being a horizontal, self-contained, strong and simple machine, it at once came into prominence, and so great has been the demand for these particular machines, that the company was obliged to run its works nights in order to supply the demand.

In 1901 the company introduced its Ideal machine, to fill the desire for a lower priced upright machine. This machine, which has many of the novel features of the Hercules, at once became a favorite among brickmakers having small or medium sized yards, as the Ideal is built in both steam and horsepower styles.

The company also manufactures disintegrators, mold-sanders, pug mills, clay crushers, clay elevators, friction hoists, represses, and in fact all the necessary machinery with which to equip a brick plant. It also makes a specialty of brick molds, both hand and machine, and all styles of trucks and wheelbarrows used on brick yards.

The company has just issued its 1904 catalogue, a neat volume which gives a full description of the goods manufactured.



General View of the Horton Mfg. Co.'s Factory, Painesville, Ohio.

The American Blower Company of Detroit, has recently shipped additional waste heat drying apparatus to both the Purington and Galesburg Paving Brick Companies at Galesburg, also complete equipment for waste heat dryers for the California (Pa.) Clay Mfg. Co., The Marion (Ind.) Brick Co., and S. J. Campbell, Independence, Ia.

Written for The Clay-Worker.

GATES' CURE FOR "CLAY FEVER."

IF YOU HAVE hay fever, you see the doctor—not the farmer; if you suffer from clay fever, consult a specialist—don't ask me."

This in effect is the advice being handed out with the most kindly intent in the world by W. D. Gates, to people who want the product of new found clay banks tested. It is the philosophical comment upon an ungrateful harvest after a liberal sowing, and the end of much endeavor.

For years Mr. Gates has acceded cheerfully to requests to test clays for this man and that, and given an opinion, based on his wide experience, of the value and character of the product. He did not stop to think in doing this that he was sowing such seed that presently a small host of happy clayworkers ought to rise up en masse and call him blessed, in addition to cannonizing him. He did not expect to see images of himself in clay or terra cotta rising at the gateways of brickyards as yet unknown. He took the trouble just to be accommodating; took it in short because he was Gates, and not for the hope of the honors which the reader realizes ought to have been thrust upon him.

Strange to say they never were, but that did not affect Mr. Gates. He kept right on being obliging, in spite of the fact that those who asked for favors often forgot to say "thank you." When, however, the applicants for gratuitous opinions began to disagree spiritedly and sometimes not over politely with his diagnosis of their "case," he began to realize that he was only the "farmer," not the "doctor," in his own field. And like the farmer he thought he knew how to treat *clay* all right, but, by Hen! the *fever* was too much for him. When he reached this conclusion he prepared the following letter in his best manner, which he proceeded to hand out to applicants in token of mild remonstrance:

> Dear Sir—With reference to clay samples we want to be perfectly fair and straightforward. The facts of the matter are, that it has taken twenty years of our most earnest work, and some hundreds of thousands of dollars to make a conclusive test of our clays Notwithstanding this devotion of time, effort and money to our task, at the present date, only an inconsiderable amount of our time is spent in cutting coupons.
>
> We discovered at an early day that the clay alone would not do the work, but that the Creator had put the clay in one place and the brains in another, and that the two had to be mixed. We had the clay twenty years ago, but it seems to be the general impression that we have never located the other ingredient.
>
> We write you now thus confidentially, because heretofore our good nature has been more pronounced than our judgment. We have accepted samples, burned them at our heat and given some advice. Our heat was probably not the heat required by the sample, nor was the advice what the owner was looking for. No good was accomplished, and our intended kindness was generally misconstrued. Really the facts of the case are, that so much of my personal time is taken up in hustling to make a few collections, and at the same time in dodging bills coming to our office, that I do not get time to experiment for other people.
>
> I shall, however, always be glad to spend a few moments with any visiting brother who has a bank, clay or national, that he wants experimented with, if he will meet me down in the dark end of the hall, where I can keep an eye on the collectors going in and out of our office.
>
> When we started this work there were no competent specialists whose services could be obtained. Now there are plenty. We are not responsible for this result, but just mention it. When you are sick you pick the best doctor, and pay him his price. Do the same for your clay fever. Respectfully,

A few days after this circular was issued Gates entered his office to find reposing in his chair a whitish sack of rough, irregular shape and plentifully covered with dollar marks. He hastened to lay hands on it. A look of suspicion and disappointment spread over his genial countenance; it felt familiarly soft and pudgy. Still, there were the dollar marks. He gingerly opened the top and peered within.

Then he laughed until Prosser and the rest of them came in to see what was up. The sack was filled with the old familiar stuff, but the joke, Gates said, appealed to him almost as much as the dollar marks had. When last seen he was holding the sack in one hand and a copy of the artistic circular letter in the other, looking in fond bewilderment from one to the other. If he made an exception in favor of the joker, it is safe to say that he is keeping it to himself.

THE CHICAGO SITUATION.

This is the last month in an unusually long winter. The weather is already beginning to moderate, the snow to melt and the frost to leave the ground and with these signs of spring in the air and under foot the daily record of building permits is beginning to show a slight increase.

The indications are that the season now barely opening, will be brisk in the building line. The trade generally looks for a big improvement over conditions last year. There will probably be less industrial friction than last year. At least it is believed that this will be the case in all lines of industry which would directly affect building projects. The price of building material of all descriptions will rule about as it was at the close of the year, which was considerably lower than during the greater part of last season. Only common brick is higher than at the close of the year, selling at the present date for $7.50. This price will probably topple to $5.50 or $6, however, where it will most likely remain throughout the season.

The proposed buildings for the coming season include structures of almost every description. Factories and mercantile buildings will figure noticeably, as will churches, schools and amusement halls. New industries will be housed here, and those already established will in many cases increase their capacity. In fact the general tone this month is exceedingly healthy indicating that money for all building purposes and especially for speculative and "ornamental" constructive work, will be freer than is customary during the progress of a national political campaign. Of course few of the contracts for these proposed jobs have been let as yet, many of them will probably not be thrown open to the dealers for bids for some time to come, but the spirit of activity is in the air. Most of the buildings under immediate consideration or for which permits have already been issued are of the apartment house type. Demand for this class of building has been brisk during the past season and although prices were boosted last spring and vacant flats are to be found, the landlords have seen fit to give rents on this class of residence another lift this spring, or at least they are threatening to do so. Their excuse is that there was little building of this type done last year. There will also be activity in the erection of small private homes during the season. These will for the most part go up in parts of the city where the price of land is not so high, although many structures are planned and some even under way in Hyde Park, Woodlawn and the better districts of the north and extreme west sides. Lake View, where an advance in flat rentals from 5 to 10 per cent. is threatened, the increase in the number of small private residences will probably be noted.

Henry Newhouse is the architect for a group of five two-story flat building to be erected in Calumet avenue between 38th and 39th streets. The total cost is estimated at about $50,000. W. C. Miller is planning a three-story, $50,000 apartment house to stand at Park Court and 44th avenue, by E. F. Noonan. G. F. Paulson is the architect. A two-story structure to stand at the corner of Norh Homan avenue and West Ohio street is being designed by S. M. Eichberg. It will contain fourteen small apartments.

Manufacturers of brick evidently look for a good year ahead, for the sale of new machinery and plants is reported as brisk. President H. J. Flood of the Chisholm, Boyd & White Company, reports that their plant at 57th and Wallace streets is busy all the time and that the flow of orders is steady.

The American Clay Roofing Company has recently been organized with Phillip D. Sloan as president. The new company is soon to open a new plant near Brazil, Indiana.

Here is a bit of brick news which though a trifle old, no American trade journal has ever printed. It dates back as far as 1728, being a bit of legislation passed by the House of Commons of Great Britain to authorize the execution of an act for the prevention of brick trusts" and the making of bad brick. It is copied letter for letter from the Historical Register for the year 1728:

"On Saturday the 9th (March, 1728) the Commons agreed to the Resolutions of the Committee to whom the Petition of Brickmakers, Tylers, and Bricklayers had been referred, viz:

"1st. That the Master and Wardens of the Company of Tylers and Bricklayers appointed to put in execution an act passed in the Twelfth year of his late Majesty's reign (entitled an act to prevent Abuses in the making of Brick and Tyles, and to ascertain the Dimensions thereof, and to prevent all unlawful Combinations amongst any Bricklayers, or Tyle-makers within fifteen Miles of the City of London, in order to advance or enhance the Price of Brick or Tyle) have not executed the same duly, so as they ought to have done.

2dly. That the Power of imposing Fines be in the Master, Wardens and Assistants of the Company of Tylers and Bricklayers or the major Part of them assembled.

3dly. That for the more effectual Preventing Frauds and Abuses in the making of Brick and Tyles, within fifteen Miles Distance from the City of London and Westminister, Power be given to the Justices of the Peace at the respective General or Quarter Sesions, to appoint Searchers, who shall have equal authority with those appointed by the said Company of Tylers and Bricklayers.

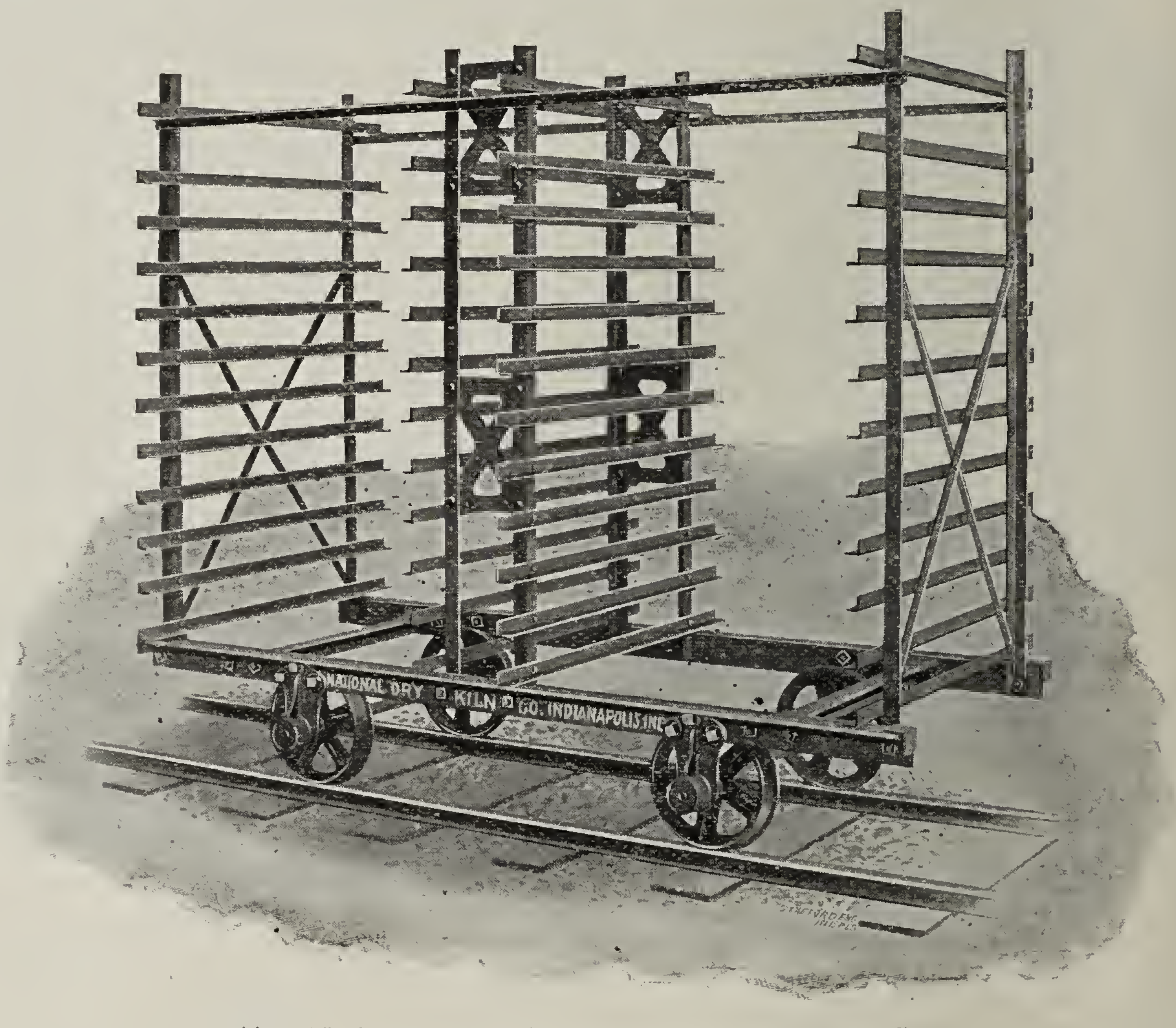
"4thly. That all bad Bricks shall be broken and destroyed, at the Charge of such Brickmakers who shall be convicted of making the same. And a Bill was ordered to be brought in upon the said resolutions."

SCRIB.

AN IMPROVED DRYER CAR FOR SOFT MUD BRICK.

WE ARE pleased to call the attention of our readers to the improved dryer cars now offered to the trade by the National Dry Kiln Company, of Indianapolis, and for which a number of advantages are claimed. The method of constructing these cars is such as to insure superior wearing qualities. Special machinery is employed for making these and similar cars for handling all manner of brick, by which they are produced economically and yet of unusual strength. While they are very strong and rigid, they run very easy and without wear.

The accompanying illustration represents one of their latest designs of steel rack cars for handling soft mud brick. Particular attention is called to the manner in which the super structure is braced by what is termed a "double truss" in the center of the car. By this arrangement perfect rigidity is given the racks, making it next to impossible for them to work loose or get out of plumb. This car is built entirely of steel with the exception of the wheels, which are of iron and are made heavy and strong, thus reducing the liability of breakage to a minimum. A special feature of this car is roller bearings made from high carbon steel, which for ease in operation is the acme of perfection.


NATIONAL DRY KILN CO. INDIANAPOLIS, IND.

The National Dry Kiln Co.'s Improved Dryer Car.

The National Dry Kiln Company also manufactures a complete line of cars for brickyard use, including transfer cars, single and double-deck cars for stiff clay brick, rack cars for soft mud brick, plain flat top cars for sand-lime brick. If the reader is in the market for any kind of a car he is requested to write them direct, mentioning THE CLAY-WORKER, and full particulars will be furnished promptly.

PATENT SUIT.

Suit was brought Feb. 23, 1904, against the Hamilton Brick Co., of Hamilton, Ohio, by the Horton Manufacturing Co., of Painesville, Ohio, for infringement of their patent on their Hercules brick machine. The Hamilton Brick Co. is using a machine made by the Arnold-Creager Co., of New London and Cincinnati, Ohio, and is called by various names such as "S. S. S.," the "New Century," the "Success," etc.

3 I L.

CLAY NEWS FROM WHEELING, W. VA.

AFTER MAKING repairs that extend over a period of several months and have cost many thousands of dollars, the plant of the Suburban Brick Company, located at Bellaire, O., will resume operation in a greatly enlarged and improved condition. Treasurer A. Allan Wheat in conversation with a representative of this paper stated that their capacity would be 12,000,000 fire brick a year, an output not equaled by another plant in the great Ohio valley. The resumption will occur about April 1st. From one end of the plant to the other all is on the most up-to-date principles. Wherever possible electricity has been brought into use and they operate in their mine under the hill the only electric drill used in the country for the mining of fire clay. The drill will make a six-foot hole in two minutes and greatly facilitates in keeping up the supply of clay, for an immense amount is consumed when the plant is working full. The mine is lighted its entire length by electricity and all danger of any explosion is avoided. Natural gas is almost the only fuel used and the brick produced by the concern is unequaled in the country for either appearance or wear. Mr. C. H. Carpenter is manager of the Bellaire plant, and it was under his directions that the extensive improvements were made. The company also own several other plants in Wheeling or its neighboring towns where they make a specialty of face, ornamental and common brick.

The Wheeling Pottery Company, who operate plants not only in Wheeling, but also in Tiltonsville, O., have of late been making quite extensive improvements to their south side plant, the old LaBelle, that will greatly facilitate work. Among these is the installation of new and larger clay bins that will permit of a larger amount being stored and prevent caking, a trouble they have been experiencing. All the plants are working full and are enjoying an excellent trade. Several new patterns have of late been placed on the market.

The local bricklayers' union may once more affiliate with the Central Labor Council after having been separated for years. The body was at one time united, but through a disagreement over a clause in a new charter that both assisted in drafting with the town council for Wheeling some years ago, they withdrew. Of late both parties have evidenced a desire to bury the hatchet and steps for a reunion are being taken.

ROBERT.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Wants to Know How to Set Drain Tile in Kiln With Brick.

Editor CLAY-WORKER:

Will you or some of THE CLAY-WORKER readers kindly give me directions how to set drain tile. in an up draft kiln with brick? How high should the brick be set before any tile are set in the kiln, and how near the top of the kiln can the tile be set, before setting more brick. Any information on this subject will be very much appreciated. J. A. FOGELSONG.

Suggestions for Kiln Troubles.

Editor CLAY-WORKER:

Dear Sir—In your January issue I saw a letter from L. E. Shaw, Nova Scotia, in relation to the Stewart kiln. We are using one of their square kilns with a capacity of 51,000 brick, and after the first burn, we have had perfect burns. After we had cleaned our flues of the refuse that fell into them during construction, our draft was free and strong enough to give all the heat required, in fact we could easily overheat, and have to watch our fires closely. Our brick takes five and one-half to six days to burn to a good color, and during the past season we have not had any soft or salmon brick from that kiln. If Mr. Shaw has any questions to ask we will be pleased to answer them, as far as our knowledge goes. Our brick is quite dense, weighing when burned about 4,800 lbs. per 1,000 brick.

Wishing you success, we are

Yours respectfully,

HOLTON BRICK CO.,

Holton, Mich. Per P. J. CONNELL.

Grateful Appreciation.

Mr. Theo. A. Randall, Secretary N. B. M A:

Dear Sir—I desire on behalf of Mother and the rest of our family to thank the National Brick Manufacturers' Association for the beautiful tribute of respect paid to the life of Father at their annual meeting held in Cincinnati, O., in February, and we certainly appreciate the high regard in which he was held by the members of the Association. Father was a member of the Association since its organization and during that time missed but one meeting. He often remarked that during all the conventions that he attended that he never asked a fellow craftsman for information, but that it was cheerfully given, and he always came home from these meetings with new ideas and suggestions that have proven of lasting benefit to us in the manufacture of brick. I shall continue to operate our plant and while I never expect to take the prominent part in public and business affairs that my Father did, I shall always make a special effort to attend the conventions and do all that I can to promote the best interests of the National Brick Manufacturers' Association.

Very truly yours, FRED B. ADAMS.

Something Doing in Texas.

Editor CLAY-WORKER:

Enclosed find New York exchange for $2.00, to pay for subscription to THE CLAY-WORKER for twelve months ending December, 1904.

On the 8th of this month we formed a brickmakers' association in Dallas and elected officers as follows: President, George E. Bennett of Milsap, Tex.; First Vice-President, Tom Hurst of Ferris, Tex.; Second Vice-President, N. N. Edwards of Gainesville, Tex.; Secretary and Treasurer, J. M. Harry of Dallas.

There were thirteen companies represented as follows: Vernon Press Brick Company, Vernon, Tex.; Gainesville Press Brick Company, Gainesville, Tex.; Atlas Press Brick Company, Ferris, Tex.; Acme Press Brick Company, Milsap; J. M. Harry & Co., Dallas; The Wilson Brick Works, Sulphur Springs; Thurber Brick Company, Thurber; Denton Press Brick Company, Denton; Kennedale Brick Company, Kennedale; Terrell Press Brick Company, Terrell; Michael Miers, Dallas; The Palmer Press Brick Company, Palmer; The North Texas Press Brick Company, Sherman, and others, in case I omitted some.

We met in the Dallas Commercial Club of Dallas, Tex., and were entertained by J. M. Harry & Co. It was a very enthusiastic meeting and all the visitors enjoyed themselves. After the meeting they were served with dinner in the dining-room of the club.

There will be another meeting in April. The brickmakers have been too unsocial with one another in the past, and we hope to accomplish much good from our Association and we will be on more friendly terms.

The building prospects in this section seem to be very good, and if all prospects materialize we will have a very good year.

We have with us but the brickmakers of North Texas, but we hope to spread in the future. The name of our Association is "The Texas Brickmakers' Association."

We think your journal is very entertaining and instructive to brickmakers and wish you well. J. M. HARRY & CO.

Kansas City Brick and Building News.

This has been an exceptionally good winter for the contractors who had jobs on their hands, and they have been able to keep their men at work a great deal of the time. The month of February contained almost all of the real winter weather we had, and there was a good many warm days to spare in that month.

The brick manufacturers have been busy, and a great many contracts have been closed which will tax the capacity of some of the plants for a good many months to come. Kansas plants are also said to be taking contracts enough to keep them busy, and the outlook is for a brisk demand for brick in this section of the country all this year.

An old brick man, in speaking of the Kansas brick proposition the other day, remarked that he had thought of going into the brick business down there, but upon thinking the matter over had decided that the brick business was going to be overdone in the State of Kansas, and that in another year or so, it would be impossible to market the output of the kilns which are already established, unless there is a material change in the position of the railroads. Sizing up the field at the present time, everything would indicate that it will be a good many years before the present plants in Kansas will be able to overstock the market. It must be remembered that the cities of the state are all building new houses, and brick is being used a great deal more than was formerly the case, and then Kansas City is going to be worth more as a market as the years roll around. Take the coming year for instance, it is sure to be away ahead of the past year, in the way of building which requires brick.

There was a great deal of work projected last year which was dropped as soon as the June flood came with its disasters. Then the balance of the year kept all the laboring men in the city busy at repair work, so contractors and investors felt like there was no use in starting any new work. In spite of this feeling there was a good deal of work completed, but nothing to what is laid out for the coming season.

Among the recent contracts for paving brick landed by the Pittsburg Brick Company, may be mentioned 12,000 yards of paving for Olathe, Kansas, where they are going to pave around the public square, and 11,000 yards for Chanute, Kansas.

The E. J. Gump Brick Company report the plant will start for the season about the middle of March, and that they will have plenty of brick on hand to keep their contractors at work until the first kilns become cool. Most of their product is sold in Northeastern Kansas, and the balance of it goes to Kansas City, Kansas, as the plant is located so that proves to be the best market.

The big Morris packing plant is now beginning to show itself, the brick masons having been at work on it several days, and that is a place where the product of a good sized brick plant can be very easily lost to sight. Then there is a number of other exceptionally large plants now being figured upon, besides thousands of smaller ones, and any quantity of residences, a goodly portion of which will be made of brick. The building of flats and apartment houses was the special craze of investors the latter part of last year, and from present indications, there is still none too many of them. They are all full, at large rentals.

The paving brick manufacturers of this part of the country should have taken a number of photographs of the business streets of this city before the asphalt companies began to repair them, and kept them on file with the date the asphalt was laid, the date the picture was taken and the number of times repairs had already been made. They certainly would have convinced anyone that asphalt is not the right paving for a business street.

The Pittsburg (Kan.) Brick Company has also consummated the sale of 2,000,000 brick to the Texas Oil Company, to be used in the manufacture of their refinery in Port Arthur, Texas.

Shreveport, La., is open to bids March 21, for 175,000 yards of paving, and they have the money on hand with which to pay for the work. The bids are for both brick and asphalt, and it is likely that some contracts for both kinds of material will be accepted. It is thought about 100,000 yards of the paving will be brick.

The price of paving brick is reported to be holding at about the same figures as last month, the following being the figures mentioned: Common salmon, $6 per M.; red and hard, $7; select reds, 2¼ inches thick, $11; vitrified, $13; first quality red pressed brick, $16; second quality, $13; semi-vitrified, $18; chocolate, $20; granite, $20; buff, $23; grey, $24.

The Mound Valley Vitrified Brick Company has been incorporated at Mound Valley, Kan., with a capital stock of $30,000.

Messrs. Acton & Kilgore, of Alvin, Texas, have purchased machinery for a brick plant which they will erect at that place at once. They also expect to manufacture pottery, jugs, etc.

The prisoners of the state penitentiary in Lansing, Kan., are a great many of them to be put to manufacturing paving brick, with which a road is to be paved to Leavenworth. This is an experiment on the part of the state, and may lead to the making of roads in different parts of the state, by penitentiary work.

Charles and Fritz Blumberg, of Seguin, Texas, have gone east to purchase machinery for a new brick plant for that city. A company has been capitalized with a $25,0000 capital.

The Tulsa Sand-Lime Brick Company has been incorporated in Tulsa, I. T., with a capital of $40,000 to make brick of Arkansas river sand and native lime. The capacity of the plant will be 20,000 brick per day. The following officers have been elected: J. M. Hall, president; Jay Forseith, vice-president; F. J. Weymouth, secretary; H. C. Calhoun, treasurer; A. S. Houk, manager.

The Washington state penitentiary has issued a schedule of prices of its product, which includes brick at $6.50 per M., or on the car at any of the near-by towns, at $7.00.

Perting & McClimans have sold their business in Nebraska City, Neb., to the Nebraska City Brick Company.

The Elma Brick Company of Elma, Wash., has begun the manufacture of brick under the management of R. Foxley.

C. A. W.

IOWA BRICK AND TILE NEWS.

The Northwestern Brick and Tile Association met in this city on the 8th, and the meeting denoted an increasing interest in the work of the association and its membership. Although the association is but a year and a half old, it is already gathering strength as an organization which promises to increase rapidly as time goes by. At the initial meeting, H. R. Bradshaw, of this city, was chosen president; F. A. Ayers of Lehigh, secretary, and John Abel of Fort Dodge, treasurer. President Bradshaw stated that the object of the organization was that of mutual improvement which may be secured through consulting together in the betterment of their wares, the improvements of methods of manufacture and the widening of the sphere in united business interests.

The territory covered by the organization extends west to Sioux City, north of Mason City, east to Iowa Falls and south to Boone. Nearly all of the operators and owners of the leading plants in this territory are members and are much interested.

Those present at the meeting listened to several interesting addresses and papers from different members which were discussed in detail and much profit and thought brought out of them.

At the election of officers, H. R. Bradshaw was re-elected to the office of president and S. C. Johnson, both of whom reside in Fort Dodge, was elected to fill the offices of secretary and treasurer. A committee on resolutions was appointed and among other things adopted was a resolution heartily recommending the passage of the bill now before the legislature providing for the weighing of coal by the railroads at destination points, and each member was instructed to write a personal letter to his representative urging him to support the bill.

The meeting ended with a sumptuous banquet, at which it was decided to hold the next meeting in this city. J. E. D.

Written for The Clay-Worker.

WITH THE BRICK MANUFACTURERS OF NORTHERN OHIO.

The Ohio Brick Company of Toledo, Ohio, held its annual meeting at its office in the Spitzer building Friday, March 11, and re-elected A. N. Kuhlman as president and general manager. J. P. Degnan, secretary and treasurer of the concern, declined to be re-elected, so the election of a new man to the place was deferred until the next meeting.

The plant of the Ziegler Filter and Pottery Company, located at Miami, six miles south of Toledo, has been closed down for some time. The concern has two contracts with the government to fill, one with the war department, the other with the navy, but from present indications it appears that he firm will be unable to fill the contracts in view of numerous difficulties which it is now passing through.

The Anderson Machine Company, of Anderson, Indiana, has been awarded the contract for the erection of the new sand-lime brick plant for the Fremont Pressed Brick and Manufacturing Company, at Fremont, O., work on the new plant having already been begun. The work will be rapidly pushed to completion and the new concern hopes to have its plant in operation within the shortest time possible.

The F. W. Ritter Potery, located at Toledo, has been running steady all winter with but few exceptions and those were when very severe weather was on. T. O. D.

Notice to Prospective Purchasers of Brick Machines.

After numerous threats, The Horton Mfg. Co., of Painesville, O., has brought suit against the Hamilton Brick Co., of Hamilton, O., for infringement alleged to exist in the construction of our "S. S. S." brick machine, as compared with their Hercules machine. As the advent of such a very superior machine as our "S. S. S." has no doubt been the cause of the greatest anxiety to the Horton Company, it is in order to now advise the public generally, that we have never had any fears that the Horton Co. would enter any suit against either ourselves or any of the users of our machines, but since they have shown such nerve, we now have no alternative but to take care of our interests; and if we show them up good and proper, in our defense of this move against the Hamilton Brick Co., which we propose to handle with the greatest vigor, and if we don't show that Mr. Horton is not the inventor of the features he claims are infringed, and also just how he caught on to building his Hercules, then we are willing to get out of the ring; but in the interval, we beg to say to all intending purhasers of brick machines, that in our "S. S. S." you will find every feature better than you expected, or even dreamed of; also that we have come to stay, and your orders will be promptly taken care of; and further, that we will amply protect you against any suit for alleged infringement that might be instituted to annoy you by our enterprising competitor. The original inventor of the machine we are now building is Mr. T. J. Paradine, of Erie, Pa., who built this machine before the Horton Mfg. Co. ever made anything like them; and we made satisfactory arrangements with Mr. Paradine for the use of his design, and have ample proof that he is the inventor. We may be addressed at either New London, or Cincinnati, O.

Yours for business,

Arnold-Creager Co.

Best Opening for Brick and Tile Works in the West.

Town of 4,000 inhabitants, well settled and prosperous community, large and growing demand for brick and tile. Good material for same close to tracks of three different railroad systems. For particulars address,

Frank A Day, *Pres. Business Men's Ass'n,*

3 1 pm. Fairmont, Minn.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

XLI. MARCH, 1904. No. 3.

CURRENT COMMENT.

Events in the far East indicate that bulk is not always the equivalent of brains.

* * *

Americans always feel kindly for the under dog in a fight. If the war continues in its present course much longer our sympathies may switch over to the bigger country.

* * *

Up to the present the war has been carried on in a fairly open and honorable manner, with few, if any, mean and measly tricks of lying and underhand vituperation. Some business opponents in this country would do well to note the example.

* * *

Every clayworker in the land who takes a just pride in his work must feel a little taller as he scans this paper and realizes that the literature of the clay industry compares favorably with that of any other calling or profession.

* * *

So many things of interest have been occupying our minds—the Eastern war, the great World's Fair, election probabilities, the N. B. M. A. Convention—that the Baltimore conflagration has not yet received the attention it merited, but the lesson is now being conned and we may expect good to result from the misfortune.

* * *

There is one feature, says Joseph M. Rogers, writing upon the Baltimore fire, in the Monthly Review of Reviews, that will interest every city in the world. It is known that the heat must have exceeded 2,800 degrees Fahrenheit, which is about the temperature that melts cast iron. It is believed that it reached 3,500 degrees. In this crucible granite melted like lead. Even on the borders of the fire, limestone seemed like tinder. Only one class of structures survived—the modern steel-construction building. There were comparatively few of these, but the Continental Trust Building, designed by Burnham of Chicago, stands up in the six hundred acres of ashes a monument of modern engineering. The architect has inspected it and finds the steel and brick intact. Only a moderate sum will be necessary to put it in commission once more. This is instructive and undoubtedly cheering, seeing that so many of these skyscrapers are being built. Architecturally, it appears that nothing is fire-proof but steel incased with brick, terra cotta and cement.

* * *

There is agitation again in Boston in respect to the moving of an historical mounment, the Park Street Church. It appears that the congregation has been offered two million and a half dollars for the site. Now the Park Street Church is merely a beautiful specimen of old Colonial architecture and like Plymouth Rock, it can be moved. With the big piece of money the work of the church could undoubtedly be carried on more satisfactorily. The Christian service of a million and a half of dollars is worth more than an architectural monument in a particular location. It is argued that if Plymouth Rock will stand moving several times and still preserve its original interest, the Park Street Church ought to stand moving at least once. In that way the country will have the church and the church will have the price.

BUILDING MATERIAL PRICES.

Good prices are always desirable—in reason. To maintain prices, to insure a fair and living margin of profit is the object of all our combinations, gentlemen's agreements and associations for reducing working expenses. A high level of prices usually accompanies general prosperity, while a low level is invariably found in countries where poverty abounds and frequent famines are at home, but still there is a sweet reasonableness even in the upholding of prices. Our labor unions are not always alive to that fact, though it is not so much the price they demand for their labor as the irritating exactions and control they seek to exercise, which have seriously impeded building operations in so many of our great cities. In the matter of prices of brick the experience of Chicago manufacturers goes to show that prices should not be held too stiffly all the time. Some time ago, when every brickyard was stocked with goods, the price was considerably reduced, with the result that there has been a large clearance and prices have been put back to $6.50, which is certainly not too high a figure. If other construction materials and labor were as reasonable, building operations in many of our cities would be on an enormous scale.

THE SAND-LIME BRICK.

There is something phenomenal about the growth of the sand-lime brick business, though we do not see that there is any need for the makers of clay bricks to be seriously alarmed. The competition of the sand-lime brick will be felt the most by the dry press brickmakers, for the new product possesses the advantages of the dry pressed brick, of even surfaces and sharp arrisses, with some additional advantages peculiar to itself. All the builders of dry presses are giving their attention to the new process and with good reason, for among the inquiries for presses received by machine makers during the last winter a large percentage, in some cases 75 per cent., are for the sand-lime brick process.

It is true that a number of these are from mere promoters, men with no special knowledge, but who are eager for any scheme that will enable them to float a company—and handle some of the funds—either directly or indirectly. There is considerable danger in this direction, for a large number of plants have been, or are in course of being started, without waiting to be assured that the first ones are a solid, commercial success. There is no comparison between the sand-lime brick of today and the sand brick of ten or more years ago, which in some cases was a mere swindle, but even the promoters of that succeeded in causing heavy losses both to stockholders and to machine and supply men. It is extremely probable that where suitable materials—sand, lime and fuel—are plentiful the new brick can be profitably made. The manufacture is essentially a brickmaker's process, with the difference that instead of burning the brick for the purpose of hardening it and giving it a permanent shape, it is steamed. There is no reason why the clay and the sand-lime brick should not be made on the same yard.

POINTERS FOR FOREIGN TRADE.

In renewing his subscription to The Clay-Worker, Mr. J. F. Villalta, 7-9 Puertaferrisa, Barcelona, Spain, writes that he has introduced considerable American clayworking machinery in his country, and that more might readily be installed there if American manufacturers would send their trade literature to him and give prompt and proper attention to inquiries. He complains that he has been accorded scant courtesy by many of our manufacturers to whom he has written for catalogues and prices. Most of them have ignored his communications entirely, and those who have replied, have as a rule, sent their communications with insufficient postage, thus subjecting him to a penalty of double the regular rates which is exacted by foreign authorities from those receiving mail matter on which there is due postage. The rate of postage to foreign points is 5 cents an ounce, or double our domestic rate. Parties sending mail abroad ought to make a practice of writing on the envelope when addressing it, where the stamp to be affixed, "5c." This will invariably catch the eye of the party affixing the stamp and guard against the affixing of the ordinary postage or domestic rate, which otherwise is very apt to happen when numerous letters are posted at one time.

Mr. Villalta states that he is in the market for brickmaking machinery—both stiff clay, soft clay and dry press—and that he will also be pleased to receive catalogues giving information in regard to the sand-lime process, artificial dryers and up and down draft kilns. He has made application for membership in the National Brick Manufacturers' Association and hopes to attend the next National Convention and to then make the personal acquaintance of American manufacturers with whom he has had business dealings. We take it that those who have failed to reply to Mr. Villalta's inquiries had no intention of being discourteous, but, not desiring foreign trade, did not deem an answer necessary. When they realize that our foreign brethren consider failure to reply to such inquiries in the light of discourtesy, perhaps they will mend their manners in this particular, but unless they observe the above suggestion their letters of acknowledgement are likely to bear insufficient postage, and so still be a source of annoyance. We beseech our foreign readers who are annoyed by such instances to remember how easy it is to make such mistakes, and to bear in mind that they are not committed intentionally, and be duly charitable in their judgment. We want credit for good intentions at least.

ANOTHER LINE ON TECHNICAL EDUCATION.

Generally speaking, the human animal is none too broad in his point of view. Just now the value of architectural education in schools is being discussed in England. Some of the round heads say that the good old English way is the best. That is, put a well educated young man in an office, and let him work out his salvation there. Another faction says, establish architectural schools, as they do in America, France and Germany. Both of these propositions are wrong. It is the same old struggle that we have always had with respect to technical education. One can not make an architect of the greatest capacity either in an office or a technical school. But the best can be done by giving him the experience of both. An architect will learn certain things in an office and he will learn certain other things in a school that he cannot learn in an office. The Institute of Technology in Boston never did and never will turn out a thoroughly practical architect. But if a young man or young woman goes through that school and then works in a first class office, he or she will be possessed of sufficient ability to make a first-class architect. This discussion as to technical education came up when Pulitzer endowed the school of journalism at Columbia. So far as we observed not a single newspaper editor in this country took a broad view of this question. Nearly all said that the place to make a journalist was in a newspaper office and derided the idea of school-made journalism, a very few favored the journalistic school, but no one said that the school was all right if supplemented by the work of a newspaper office, and a better journalist could be made thus than in either the office or the school alone. This is true of all schemes of technical education. The practical work will do what the school can not do and the school will do what the practical work can not do. But both are absolutely and inherently necessary.

WHAT IS FIREPROOF?

Whenever a great fire occurs public attention is drawn to the question of fire-proof buildings, but the uninstructed public can do nothing in the matter and the influence, if any there be, of ignorant newspaper writers can only be in the wrong direction. When some great disaster happens, involving immense destruction of property or deplorable loss of life, general interest is aroused, but in a short time this dies out and things go on as before, so that the annual direct loss from fires in the United States amounts to a sum that seems incredible and ought to be impossible. A sum that is equal to half the total value of the wheat crop of the country! For the fire losses during the year 1903 are estimated at the vast sum of $165,000,000.

It is indisputable that the fire departments of this country are the best in the world. The engines and appliances are the most powerful and ingenious; the men and officers the most daring, intelligent and skillful. There is probably very little more to be done in the improvement of methods for the extinction of fire, and we must turn in some other direction for help from the scourge.

Since, in spite of the excellence and astonishing promptness of our fire fighters, the country still has to suffer such immense losses from fire, should we not give our attention to the first, instead of the last end of the matter? Make our buildings as nearly fire-proof as possible and put coverings on them that are less inflammable than shingles or a tar-and-gravel roof.

Some tin-plate men have come out with a statement that a tin covered roof proved the best in Baltimore. The coolness of such an assertion ought to be sufficient itself to put out a fire.

A roof covered with tiles made from burned clay is the only one that offers a real resistence to fire, and this brings us back to the question: What is fire-proof?

Actually nothing is fire-proof. Platinum melts readily in the oxy-hydrogen flame and there is nothing known to exist that, in the highest heat of the electric furnace, will not either melt or volatilize, but everything that is not combustible is more or less resisting. Fire-resisting, not fire-proof, would be the better term.

We have, however, to take terms as we find them, and fire-proof is in such general use that we must employ it, too, but with the understanding that when we say fire-proof we only mean fire-resisting.

The greatest fire resistance would evidently be expected from that material which has been subjected to the extreme heat of a kiln for the purpose of ultimately fixing its form. This includes every kind of clay product, brick, terra cotta, fire-proofing and roofing tile, to the clay brick may also be added the modern sand-lime brick.

Instead of fire-resisting materials we put as much combustibles in our buildings as we can. This applies especially to our dwellings, our homes. For a home of the best kind we build a big case of brick or stone, much upon the same plan that a furnace would be built, then fill it with highly combustible material, wood floors, wood partitions, wood staircases, wood closets, wood doors, window frames, sashes, balusters, wainscoting and sometimes ceilings. All this wood work we coat with something still more combustible in the shape of paint or varnish, and when the winter comes we make it all as dry as tinder by means of stove, furnace, steam or hot water heat. Is it through ignorance or cupidity that this is done? Most likely it is ignorance, for even the homes of the wealthy are built in this way. The dwellings of those to whom money is of no consequence and who could, with advantage in every respect, in appearance, cleanliness and comfort, substitute clay products for the cheaper and easier worked lumber, are designed and built in the same old way.

Our architects need educating upon this as well as some other points.

TRADE LITERATURE.

THE HENRY MARTIN BRICK MACHINE MFG. COMPANY, Lancaster, Pa., has just issued a new catalogue, No. 80. It is very striking in appearance. The cover is a combination of red, white and blue on a grey background. It is a book of 150 odd pages, profusely illustrated with views of the Martin factory and plants using Martin machinery. Each of their different styles of brickmaking machinery, which includes the soft clay, stiff clay and dry press processes, is fully illustrated, also a complete line of brickyard supplies, which includes everything needed about a brickyard, from a common shovel to a steam engine. A copy can be had for the asking.

THE AMERICAN ROAD MACHINERY COMPANY, Kennet Square, Pa., has favored us with a copy of their 1904 catalogue. The cover is very unique and shows in a fine way the possibilities of modern half-tone printing. The frontispiece is a general view of their immense plant, which embraces 100,-000 square feet of floor space and is the largest works in the world devoted exclusively to the manufacture of road-working machinery. Next comes a fine half-tone engraving of their No. 4 Champion crusher. This machine is being used very successfully by many clayworking plants for the purpose of reducing hard shale before it goes to the dry pans. This, it is found, doubles the capacity of the dry pan for such material. The book also contains a number of interesting views of their road-building machinery. They will be pleased to mail a copy to any of our readers, but request that they mention THE CLAY-WORKER when writing for it.

THE ROSS-KELLER TRIPLE PRESSURE BRICK MACHINE COMPANY, St. Louis, Mo., has out a new catalogue. The cover is a pleasing combination of a rich terra cotta color with lettering in black. It is illustrated with a series of new half-tone plates of their famous dry press, the merits of which are tersely set forth. A line of clay disintegrators and pulverizers are also illustrated, also a variety of wheel-barrows, especially adapted to dry press plants. If interested, write for a copy.

"THE EVIDENCE IN THE CASE" is the title of a neat little brochure published by J. C. Steele & Sons, Statesville, O. It contains a series of interesting testimonial letters from users of their "New South" stiff mud brick machine. They will gladly mail same on application.

THE UNITED STATES SANITARY COMPANY, Washington, D. C., is mailing a neat little leaflet telling of the merits of their clay screen. If they have missed any readers of THE CLAY-WORKER it is not intentional, and they request that they send their address to them.

H. BREWER & CO., Tecumseh, Mich., has issued their forty-fifth annual catalogue of clayworking machinery, and it is a "beaut." The cover is a rich combination of brown, red and blue. It contains much interesting matter on the manufacture of brick and tile. The large family of Brewer machinery, automatic cutters, clay crushers, pug mills, elevators, tile tables, etc., are fully illustrated and the merit of each particular device clearly set forth. They request those of our readers who have not received a copy to write them for it.

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AS CONSULTING ENGINEER for established brick companies my services should be worth many times the small annual fee charged. Only a few more such engagements desired.

WILLARD D. RICHARDSON,
Brickworks Engineer.

See page 421.

WANTED, FOR SALE, ETC.

WANTED—A foreman capable of running a Boyd Dry Press and soft mud brick machine. Must thoroughly understand his business. Address
BOX 54,
3 1 c Independence, La.

WANTED—Position as superintendent of soft mud, stiff mud or dry press brick plant. Over 20 years' experience in the manufacture of fire brick, building brick and tile. Can furnish best of references as to ability and character. Address
BOX 100,
3 1 d Care Clay-Worker.

WANTED—Situation as superintendent or foreman of a brickyard by an experinced man familiar with both stiff clay and soft clay processes. Understands burning and the care of machinery. Best of references; a permanent situation desired. Address
M. T. V.,
3 1 ? Care Clay-Worker.

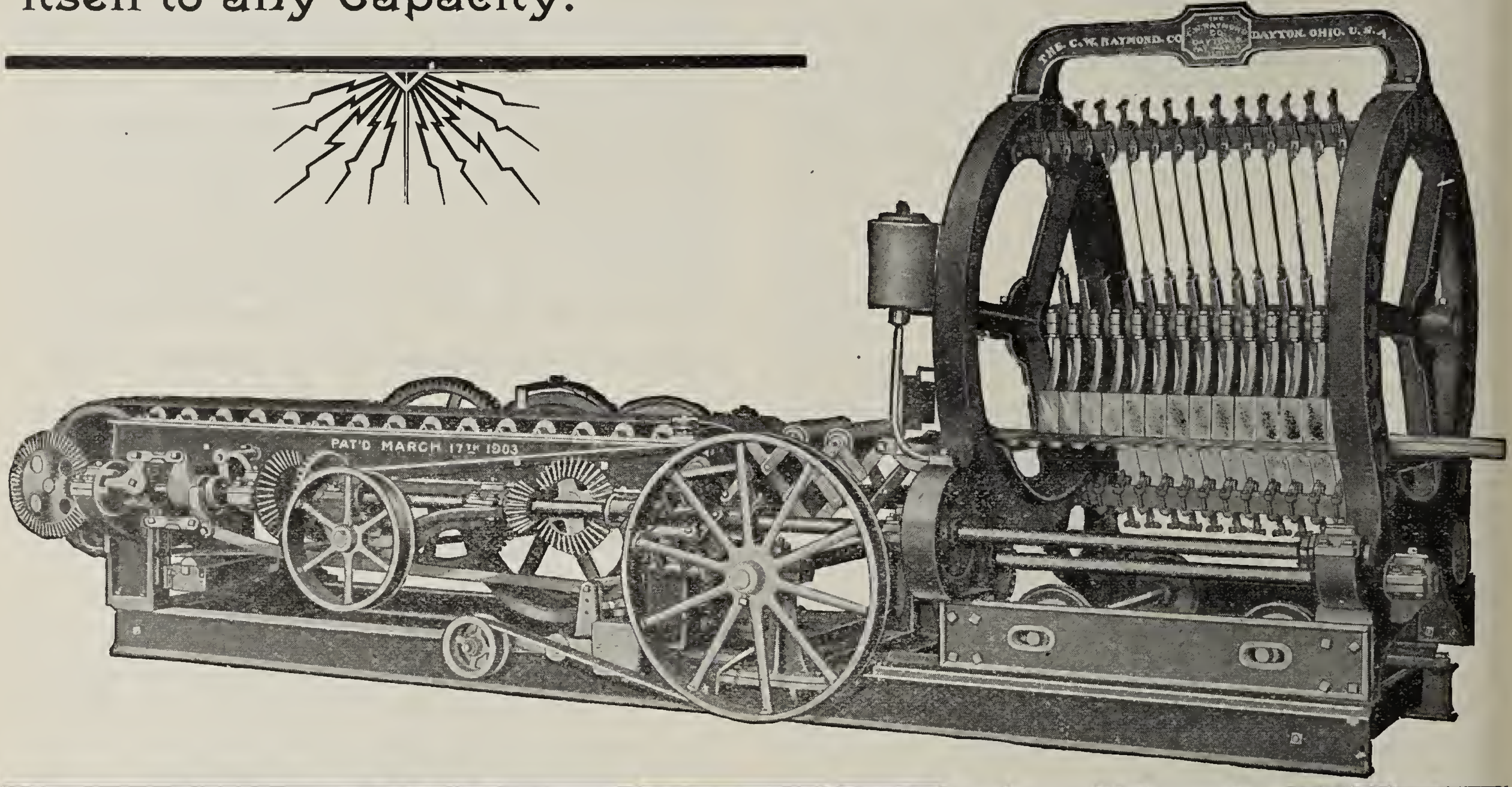
WANTED—A situation as superintendent or foreman in a pottery. Have had several years experience. Understands the various methods of manufacture; competent to superintend the burning and direct workmen. Good references as to character and ability. Address
W. O. L.,
3 1 ? Care Clay-Worker.

WANTED—A competent and reliable man to superintend the operation of a small brickyard, now making 10,000 a day by the soft mud process. Must understand the management of men and be able to burn successfully. Must be temperate and industrious. Address
T. R. BURT,
3 1 ? Care Clay-Worker

For Sale, Wanted, Etc., Ads Continued on Pages 420 and 421.

YOU CAN MAKE GOOD BRICK

just as cheaply as poor ones, and get more for them. Isn't it a business proposition, therefore, to equip your plant with machinery that will make the **Good Ones**? It costs no more and the results are tenfold better. This Cutter has a down shear cut. Cuts true to line and leaves no feather edges. It has a continuous rotary motion and regulates itself to any Capacity.


THE C. W. RAYMOND CO
DAYTON, OHIO, U. S. A.
PAT'D MARCH 17TH 1903

The RAYMOND AUTOMATIC CUTTING TABLE

THE C. W. RAYMOND CO., DAYTON, OHIO, U. S. A.

Boston, Mass., July 24, 1903.

THE C. W. RAYMOND CO., Dayton, Ohio.

Gentlemen :—We are pleased to state that the Automatic Side Cutting Machine which you installed at our plant at Dover Point is a success. We are no doubt making brick of a clay which is difficult to manipulate. It will not bear great pressure without distortion.

The first cutter we used was driven by the clay bar itself, and swelled the bar very badly out of size and shape so that the bricks were delivered with great variation as to length and height. With your cutter, however, which is driven positively from the Brick Machine itself, the speed being regulated by the governor to correspond with the travel of the clay bar, all of these difficulties have disappeared and we are getting a perfectly square and even size brick, cut true to line, and we can moreover use the clay in a very soft condition.

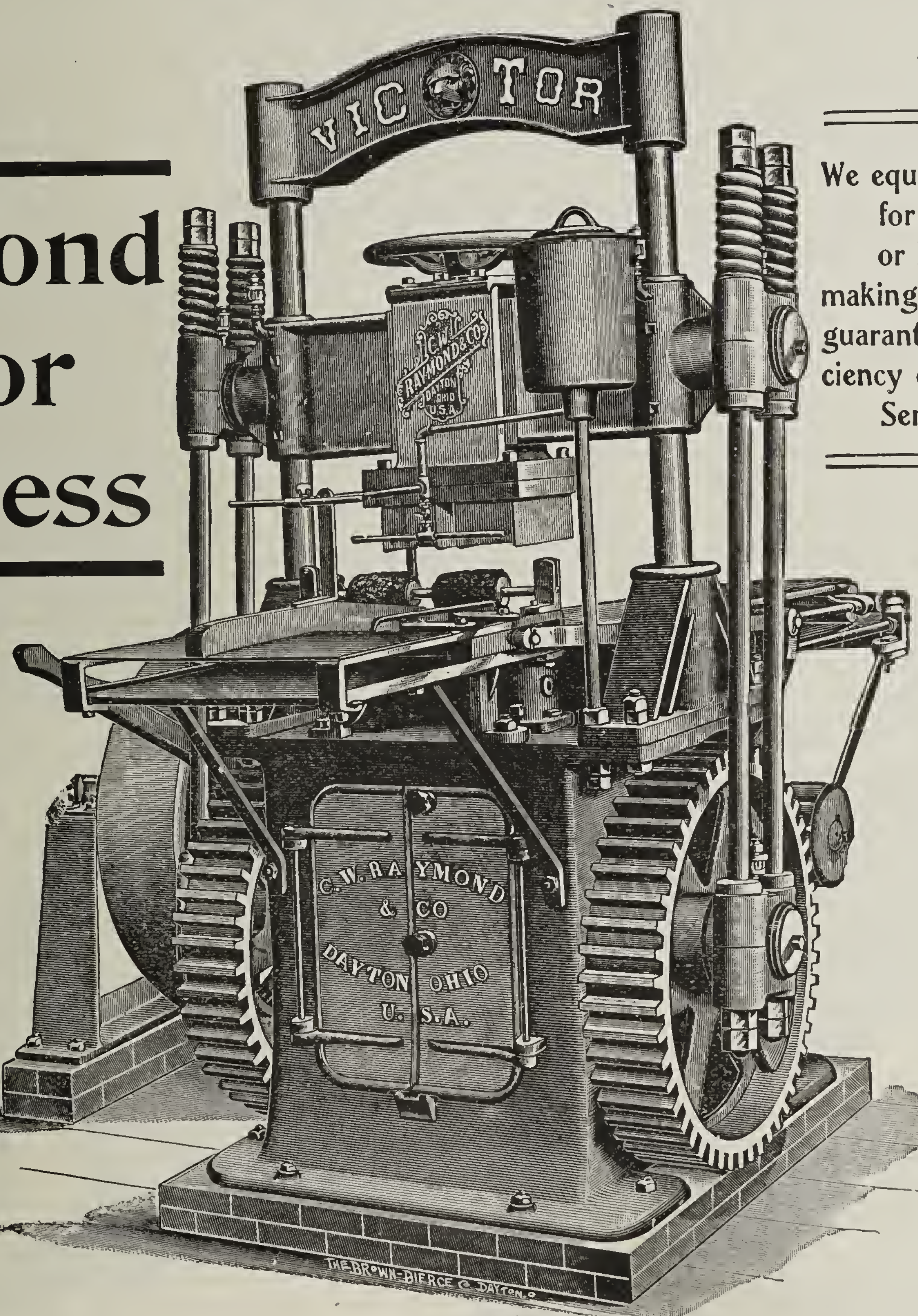
Altogether, we can heartily recommend your cutter to any one desiring to make a first-class wire-cut face brick.

Very truly yours, THE FISKE BRICK CO.

THE VICTOR RE-PRESS

Do You Re-press your Brick? Do you give them the smooth surfaces, the square corners, and keen edges necessary to make a high-class brick? Do you recognize the worth as an advertisement, of your distinguishing imprint upon each brick? All these advantages can only be had by re-pressing. Re-pressing enhances not only the beauty of the brick, but their utility and sale value. The Victor has attained an unequaled distinction and had a phenomenal sale for this class of work. Its advantages and conveniences are so manifold, as to place it in a class by itself. The first machine that meets your eye on a well-equipped brick plant, is a VICTOR RE-PRESS. IT IS A MONEY MAKER AND A MONEY SAVER

Raymond Victor Re-Press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C. W. RAYMOND & CO. DAYTON OHIO U.S.A.
C. W. RAYMOND & CO DAYTON OHIO U. S. A.
THE BROWN-BIERCE CO DAYTON O

We equip plants complete for Building, Fire or Paving Brick making the most liberal guarantees as to the efficiency of our machinery. Send for Catalog

THE C. W. RAYMOND CO., DAYTON, OHIO. U. S. A.

NEW YORK OFFICE
39—41 Cortlandt Street, Room 40

Written for The Clay-Worker.

PACIFIC COAST NEWS.

BUILDING OPERATIONS during the month of February in San Francisco were entirely satisfactory. The total of new buildings projected reached the aggregate sum of $1,039,937. This amount represents the issuance of 136 permits. This shows an unusually high average value for each permit. The amount of brick building has been large and the amount figured for the future is still larger.

Lowery & Daly, contracting dealers in tiling, terra cotta, pipe, etc., have won their suit before the United States Court against the Tile, Mantel and Grate Association of California, and a large number of manufacturing concerns who are accused of joining with the above association in discriminating against Lowery & Daly. It is claimed that owing to the actions of the members of the association and the manufacturers, Lowery & Daly were prevented from purchasing tiles and materials, except at list prices, from which a reduction of 50 or 75 per cent. was allowed to members of the association. The suit was begun under the Sherman anti-trust law and after being won by Lowery & Daly in the lower courts, has been decided in their favor by the Supreme Court.

The Holland Brick Company, whose plant is located at Antioch, Cal., has shut down temporarily, pending the installation of new machinery and the construction of new buildings.

Richard Loynes has successfully burned his first kiln of brick for the year. The kiln contained 400,000 brick which were burned by 33 oil burners in operation for five days.

The Diamond Brick Company, a new enterprise in Vancouver, Wash., located on the Columbia river, has about completed the installation of its new sewer pipe, terra cotta and brick manufacturing plant. It is the intention of the company to have the plant in active operation by the first of June and to specialize on vitrified and pressed bricks. A three thousand gallon oil storage tank will be erected at the works and oil will be used as fuel. C. W. Huggins, formerly with the Western Clay Company, but more recently with the Little Falls Fire Clay Co., of Wash., will be manager of the new plant. George W. and William Bates are the principal stockholders in the company.

Mr. Louden, secretary of the Wheeland Brick Company, of Mountain View, Cal., reports the plant to be in good condition and to have more orders on hand than can be conveniently filled.

J. E. Mitchell, who operates a brick yard at Modesto, Cal., has just installed a Winget concrete brick machine in his yards with which to manufacture hollow concrete brick. The machine has a capacity of 6,000 brick per day.

George W. Lord and Dick Richardson, of Corona, Cal., have discovered a rich deposit of clay in the mountains south of town.

Incorporation papers have been filed at Portland, Ore., by the Oregon Sand-Lime Brick Company, with a capital stock of $25,000 and the following directors: E. E. Angell, William Bennett and Louis Sommer. Mr. Angell has discovered and perfected a process for manufacturing a special brick for ornamental and building purposes, which has the appearance of granite. Mr. Angell is now contemplating the erection of a manufacturing plant in Baker City, Ore.

The Day Clay Company, of Whatcom, Wash., is contemplating the installation of a plant for the manufacture of vitrified and ornamental brick this summer.

Since the reorganization of the Palouse Pottery Company, of Palouse, Wash., about $5,000 has been spent in perfecting the equipment and in adding new machinery. An engine room has been added to the building on the west in which is installed a forty-horsepower engine and a sixty-horsepower boiler. This furnishes power for the molding, which was formerly done by hand, and increases the capacity of the plant about four times and also enables the company to manufacture much larger pieces than formerly. The new machinery was put in operation about the middle of February and so far has given excellent satisfaction. A smoke consumer has also been put in which saves 25 per cent. in the fuel account.

Secretary Swartwood has just returned from a short tour south and west as far as Baker City, Ore. He booked orders for four full car loads of pottery and a number of small orders aggregating another car load or two. President King of the company, is now absent, on a business trip. It is announced that a plant for the manufacture of sewer pipe, drain tile and fire brick will be put in shortly.

On February 29th the Stockton Brick and Pottery Company of Stockton, Cal., began suit against the city of Stockton to recover $5,000 alleged to be due for sewer pipe furnished the city and used in the construction of outfall and rain-water sewers. It seems that the company was awarded the contract by the Board of Public Works notwithstanding the fact that it was not the lowest bidder. After sewer pipe to the value stated had been delivered, M. J. Henry brought suit to prevent the city from receiving the pipe, and the court held that the contract should have been awarded to the lowest responsible bidder. The Stockton Brick and Pottery Company now sues to secure payment for the pipe furnished before the mandamus proceedings were bgun.

The Verstug-Gor Brick Company has been incorporated at Portland, Ore., with a capital stock of $25,000. The incorporators are G. W. Verstug, Marion Verstug and Angus Gor.

A company is now being organized at San Louis Potosi, Mexico, for the purpose of opening a brick factory at Soledai Diaz Guetirrez, where it is claimed that large deposits of suitable clay have been discovered.

The Union Stone and Brick Company, has been incorporated at Salt Lake, Utah, with a capital stock of $50,000 for the purpose of engaging in the brick and stone trade. The officers of the new company are James Thompson, president; H. C. Edwards, treasurer; J. D. Stack, vice-president; and E. P. Sears, Secretary.

The city authorities of Tuscon, Arizona, have practically decided to make brick the standard material for sidewalks in the resident districts of that city. This decision has been arrived at partly because the cost of brick sidewalks is much less and because the repairing is also less expensive and partly because the use of brick will encourage a home industry.

Messrs. Johnson and Macy of Chico, Cal., have decided to establish a brick plant at that place. It is expected to burn between 1,000,000 and 3,000,000 brick at the plant this coming season. For the present it has been decided to use wood fuel, though it is probable that oil will be used later on. The daily capacity of the plant will, it is said, be about 30,000 brick per day.

San Francisco, Cal., March 5, 1904. SUNSET.

OH, GEORGE!

Weary—"My goodness! but you gave me a start!"—Judge.

OVER
175
"Monarch"
Brick
Machines
in use.

OVER
500
"Quaker"
Machines
in use.

WRITE
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Disintegrators,
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Castings.

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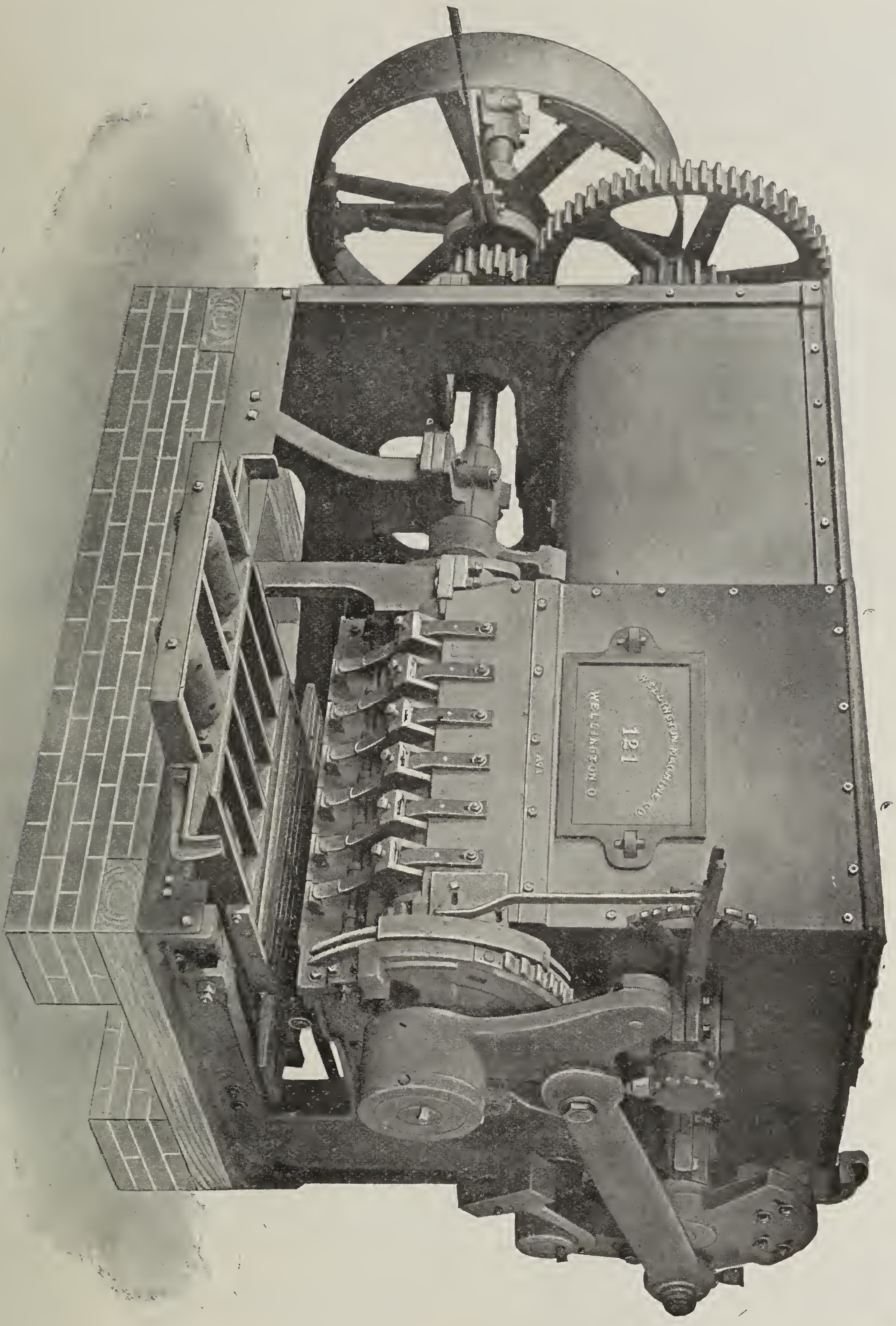

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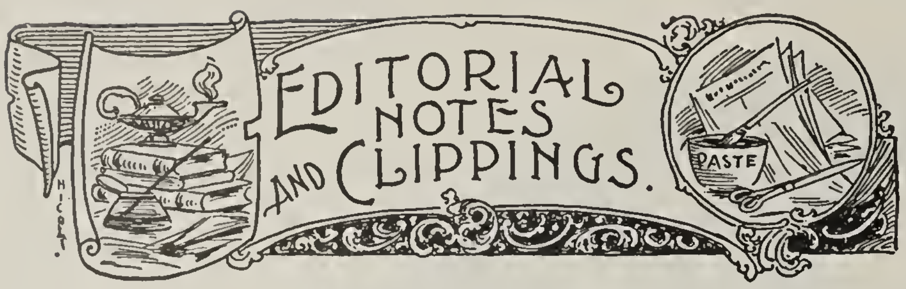


EDITORIAL NOTES AND CLIPPINGS.

A HEALTH THOUGHT.

Oh! brave the winter's sloppy slush
And chill breeze if you choose,
But don't forget in all your rush
To wear your overshoes.

J. P. Willis, Mt. Vernon, Ind., will establish a brickyard at that place in the near future.

The Apollo (Pa.) plant sustained a $500 loss by fire recently which started in the dryer.

The Bitner Fire Clay and Brick Company of New Castle, Pa., has changed its name to the Volant Clay Mining Company.

Harry Canan writes that a company in which he is interested is being organized at Londonville, O., for the manufacture of brick and tile.

A company has been organized to manufacture brick and tile at Big Prairie, O. V. M. Gettuis, E. W. Miles, G. S. Sanborn and others are interested.

Garrett Bros. of North Yakima, Wash., contemplate the erection of a large brick and tile plant at Prosser, Wash., where they have a fine bed of clay.

The Nebraska City (Neb.) Hollow Brick Company is the name of a new concern recently organized at that place. A. M. Munn is the manager of the plant.

Martin Sangesand of Madison, Wis., has purchased of Johnson & Peterson a third interest in the Linn Grove Brick and Tile factory, paying $2,500 for the same.

Acton & Kilgore will establish a brick plant at Alvin, Texas. They have had the clay tested with satisfactory results, and expect to manufacture all kinds of pottery, jugs and common brick.

The Union Stone and Brick Company, Salt Lake City, Utah, has filed articles of incorporation with $50,000 capital stock. The officers are James Thompson, President; H. C. Edwards, Treasurer, and E. P. Sears, Secretary.

The De Soto Brick Company of Mansfield, La., is a new concern recently organized by J. J. Snell and J. A. Snell of Dothan, Ala., and William Goss and B. Y. Wemple of Mansfield. The company is capitalized at $5,000.

The Day Clay Company, Whatcom, Wash., is contemplating the installation of a plant for the manufacture of vitrified and ornamental brick, which they will operate in connection with their common plant.

The Minor Brick Works at Empire, O., was almost totally destroyed by fire recently, involving a loss of $40,000, on which there was an insurance of $25,000. The flames started in the machinery department, and this part of the plant is a total loss. The plant was owned by the Stowe-Fuller Company of Cleveland and Minor Bros. of Empire. It will in all probability be rebuilt.

John Otte contemplates establishing a brick and tile plant at West Point, Iowa.

E. Spinks advises us that he will erect a brickmaking plant at Whitney, Fla., in the very near future.

John R. Worden and J. Bradley of Hall, Ind., will build a brick plant at Mooresville, Ind., of 30,000 brick a day.

The Stevens Point (Wis.) Brick Manufacturing and Construction Company has been incorporated with $10,000 capital stock.

The Ohio Brick Company's plant at Upper Sandusky, O., has been purchased by D. E. Fernbaugh. He will at once begin the operation of the plant.

Fred Brinkman has purchased the Jungbluth brickyard, which he will run in connection with his other yard, thus giving him a daily capacity of 20,000 brick.

The Flint (Mich.) Sandstone Brick Company has purchased a tract of land on which they will at once erect a plant for the manufacture of sand-lime brick.

The Blumberg Brick Company has been organized to manufacture brick at Seguin, Tex. Those interested are H. F. Koepsel and C. F. and Fritz Blumberg.

The Blytheville (Ark.) Brick and Tile Company has been chartered. The capital stock is $10,000. The directors are J. H. Edwards, H. C. Davis and R. L. Morris

The Towle Brick Company has been incorporated at Cleveland, O., by Wilkin Towle, E. S. Cook, A. R. Manning, Jr., A. T. Brewer and M. L. Fowler, with a capital stock at $15,000.

The Livengood Brick Works at Scottdale, Pa., which has been shut down for several years, will be operated this year. The plant has a capacity of 20,000 a day. Walter R. Livengood will have charge of the plant.

Joseph Godkin and J. J. Allen are sending out announcements to the effect that they have succeeded to the ownership of the brickyards of Gotham & Co., at Cold Creek, N. Y. The office of the company is located at Watertown, N. Y., and the firm will be known as Godkins & Allen.

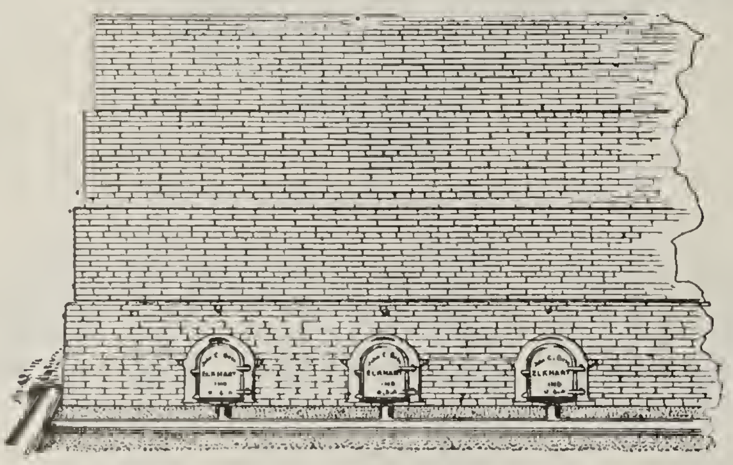
A new clayworking company has been organized at Newton-Hamilton, Pa., to be known as the Newton-Hamilton Brick, Pottery and Cement Company. The company is capitalized at $60,000 and work on a plant will commence at once. Dr. D. C. Nipple, B. E. Morrison and others are interested.

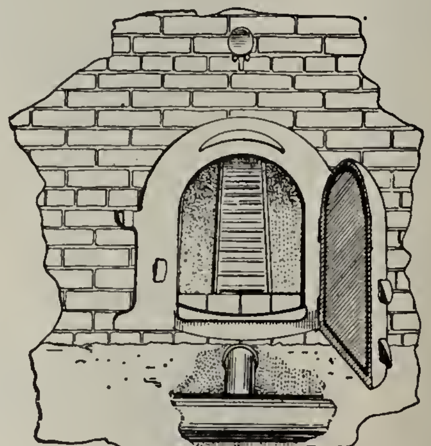
Messrs. Kiester & Bauman have purchased a two-thirds interest in the Monroe Steam Brick Works at Monroe, Wis. The third partner is Mr. Schober and the firm name will be changed to Kiester, Bauman & Schober. They will make a number of improvements in the plant, adding new machinery, etc.

Charles Harris of the Harris Brick Company, Zanesville, O., died at his home in that city as the result of a stroke of apoplexy. Mr. Harris had been in failing health for some time, but his death came suddenly. Mr. Harris was seventy-two years old and had been engaged in the brick business for forty years.

C. Clayton Bourne has leased the brickyard at Fishkill, N. Y., next north of the one operated by him for several years past. The yard leased is at present occupied by Mr. Dinan and is owned by the Verplanck estate. Mr. Dinan has expended considerable money on the yard, and Uriah Washburn of Haverstraw, John McNamara of Fishkill and Wm. H. Hilton of New-

[CONTINUED ON PAGE 418.]





The Boss System of Brick Burning

requires no outside furnaces which are expensive to build and maintain; will burn slack and poor grades of fuel which can not be consumed with success in any other manner.

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Descriptive Catalogue.

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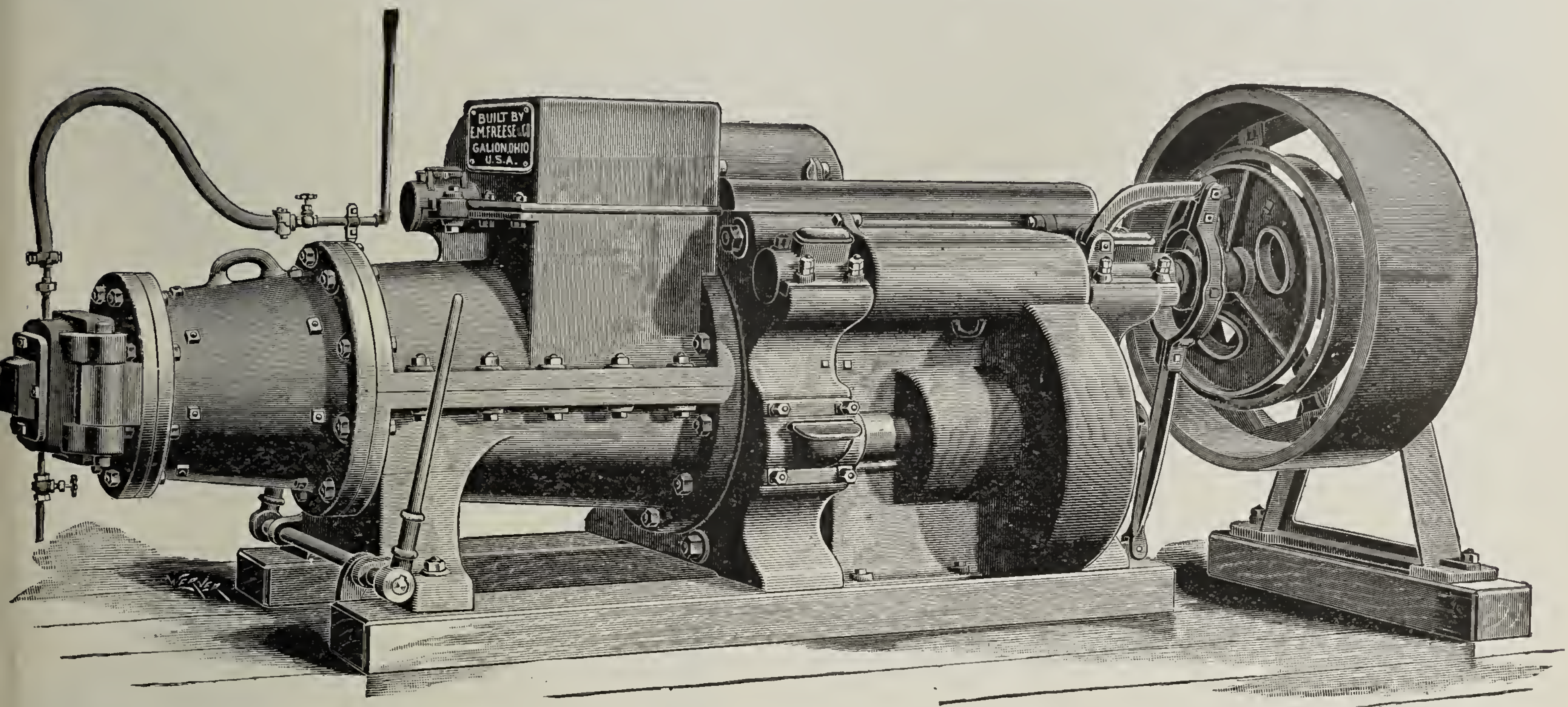
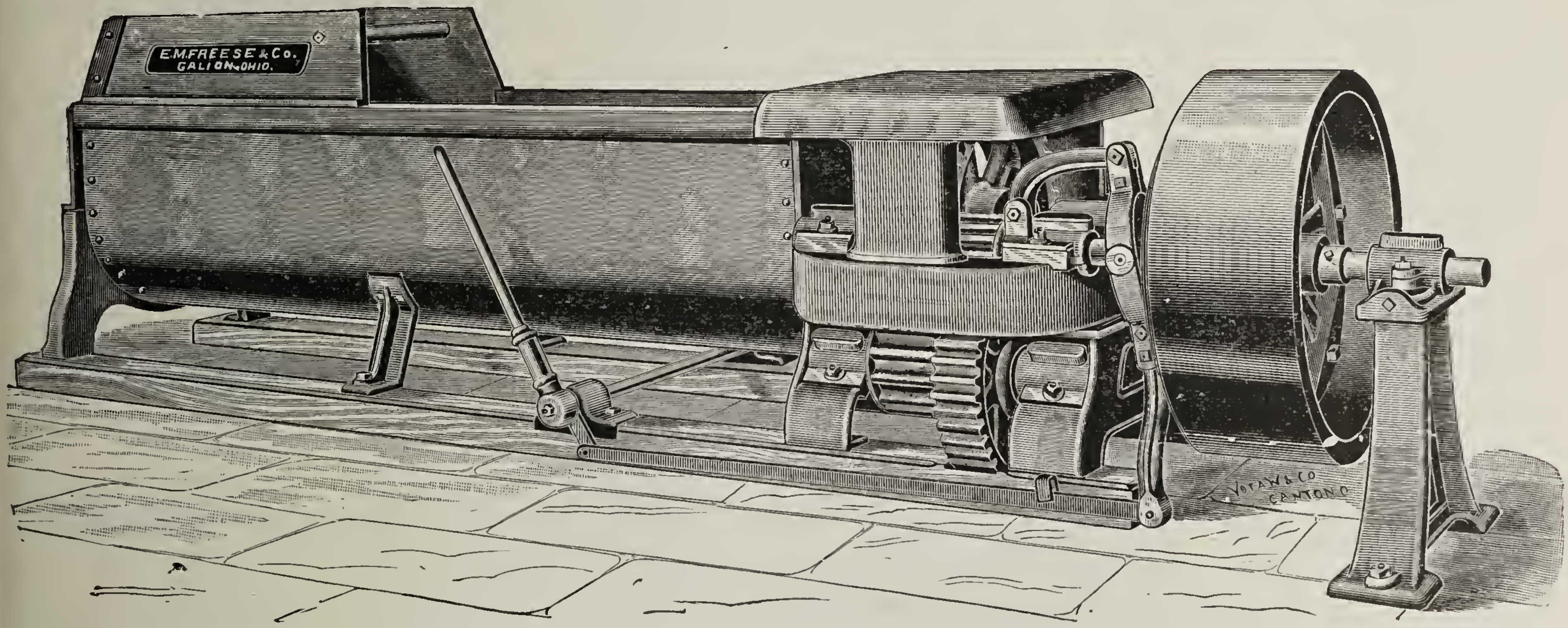
Our Mammoth Brick Machine



THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

Our Pug-Mills Have Features of Great Merit.


E.M.FREESE & Co.
GALION, OHIO.
VOTAW & CO
CANTON O

THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 458 and 459.

EDITORIAL NOTES AND CLIPPINGS—Continued.

burgh were recently agreed upon by Mr. Bourne and Mr. Dinan to appraise the amount to be paid by Mr. Bourne for the improvements.

H. H. and James E. Kaps have purchased their father's brickyard at Portsmouth, O. They will enlarge the capacity of their plant and will also go into a general contracting business.

M. J. Braun & Sons write that they have their new plant at Athens, Wis., well under way. They have put in a C. & A. Potts & Co. outfit and expect to be in full operation by May 15.

The Southern Brick Company has just been organized to manufacture brick at Pensacola, Fla. Charles K. Weller is general manager of the new concern, which has an authorized capital of $25,000.

The plant of the Terre Haute (Ind.) Brick and Pipe Company was shut down for a few days recently owing to the installation of an immense new 350 horsepower Corliss engine. They have also added a new brick machine with a capacity of over 50,000 brick a day.

The Pensacola Brick Company has been incorporated at Pensacola, Fla., for the purpose of manufacturing brick, tiles and other clay ware. The incorporaters are Knowles Hyer, W. H. Knowles, J. S. Walton, H. G. De Silva, W. B. Ferriss, P. A. McLean and O. H. Smith.

Ed. Holmes has put a new brick machine in his brick plant at Spring Valley, Ill., from the shops of the Horton Manufacturing Company at Painesville, O. Mr. Holmes started in a small way a couple of years ago, but is now enlarging his plant considerably.

The Centerville Terra Cotta, Brick and Tile Company, Centerville, Iowa, has filed an amendment to their charter changing the name of the company to the Centerville Brick and Construction Company. W. G. Clark is president and W. M. Peatman secretary of the concern.

The Milholland Pressed Brick Company has been organized at Marion, O., with a capital stock of $100,000. The incorporators are Horace W. Whayman of Dayton, Lenox Reber, J. W. Milholland, J. W. Sifritt, C. W. Criswell and J. J. Woodruff of Marion. They will manufacture sand-lime brick.

The Oxford (Miss.) Brick and Tile Company has been organized at that place. B. F. Kimbrough is president, W. Lewis vice-president and J. J. Vance secretary and treasurer. Work has been commenced on the plant and will be pushed to completion as rapidly as possible.

The South Bend Brick Company of South Bend, Ind., has purchased a complete Raymond outfit for their new plant, consisting of a 999 brick machine, automatic cutting table, pug mills, re-presses, etc. They will have a capacity bordering on 100,000 brick per day.

The Iowa Brick Company, Des Moines, Iowa, which a year ago installed a special press at its plant for the manufacture of flower pots, milk pans and the cheaper grades of clay goods, has met with such a demand for the output that it is now arranging for the installation of a second press and the doubling of its output in this department. It is also planning to put in machinery for the manufacture of tile.

The name of the New Jersey Terra Cotta Company, Matawan, N. J., has been changed to the New Jersey Mosaic Tile Company. The plant will be operated under the same directorate as heretofore. They no longer manufacture terra cotta at their Matawan plant, but have been turning out floor tiling for a couple of years; hence the change in name. However, they are still manufacturing terra cotta at their Perth Amboy plant, which will continue to be operated under the same name as heretofore, the New Jersey Terra Cotta Company.

In a recent letter L. R. Whitney, general manager of the National Drain Tile Company, Terre Haute, Ind., writes: "We are running all of our factories to their fullest capacity, and now that our Summitville works has 'thawed out' after one of the coldest winters we have experienced for many years, we are running the plant there night and day until we catch up with our orders. We are turning out tile at the rate of fifteen car loads a day, and the demand is something fierce. We are figuring on an addition to our Terre Haute plant sometime in the future."

We have received a very useful and handsome pocket memorandum book from Arthur Koppel, manufacturer of narrow-gauge railway materials, 66-68 Broad street, New York. It is shaped to fit the vest pocket. Twenty-six pages are devoted to useful information on various subjects and the balance of the pages are blank for memoranda. The cover is of celluloid with a picture in the center of a standard steel side-dump car, dumping to both sides, which is one of the many different styles of cars manufactured by this firm. A copy of this book will be sent upon request, also a complete catalogue of railway materials, to all interested parties.

Samuel Palmer, 1031 Cherry street, Kansas City, Mo., writes that he expects to manufacture brick at that place the comnig year.

CEMENT AND SAWDUST TILES.

Excellent tiles can be made with a mixture of Portland cement and sawdust. Nails can be driven through these tiles without causing them to crack. In a recent issue the *Thonindustrie Zeitung* the following proportions were given as suitable for the manufacture of the tiles: Damp sawdust 100 parts by weight, Portland cement 240 parts, water 48 parts. The sifted sawdust is well moistened and allowed to stand for twenty-four hours before being employed for mixing with the proportions of cement and water mentioned. The sawdust is used in a damp condition to prevent it from absorbing from the mixture the water required for the proper setting of the cement; and during the process of drying after molding, the tiles are repeatedly sprinkled with water with the same object in view. Previous attempts to make durable tiles with a mixture of sawdust and cement are said to have failed owing to the absorbent action of the sawdust.

SAWS

ODD LENGTHS OF RUBBER,
AND GIANT RED STITCHED,

from 2 ft. to 80 ft long, and from 1 in. to 16 in wide; 3, 4, 5, 6 and 8 ply FIRST-CLASS BELTING less than mfrs. cost prices. GET OUR PRICES on Rawhide, Paulins, Tank Pumps, Hose, Injectors Steam Gauges, Brass Fittings, Lard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Sawing Machines, One-Man Log Saws Asphalt Felt Roofing, Endless Thresher Belts. One Trial will make you a regular customer of the

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Minnesota, North and South Dakota

And many other points in the

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DATES OF SALE:

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Indianapolis, Ind.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XLI. INDIANAPOLIS, IND., APRIL, 1904. No. 4.

A FIRE-PROOF BUILDING THAT WAS FIRE-PROOF.

A Demonstration of the Superiority of Structural Clayware.

AS MANY of the readers of THE CLAY-WORKER are manufacturers of fire-proofing material, it may be of interest to them to know something regarding the conditions surrounding the Granite Building, which passed through the most disastrous fire that ever visited Rochester. There were nearly two acres of ground burned over in the heart of the city; entirely covered by buildings from four to twelve stories in height and nearly all occupied on the ground floor by department stores, wholesale and retail, and in some cases seven stories were occupied as such.

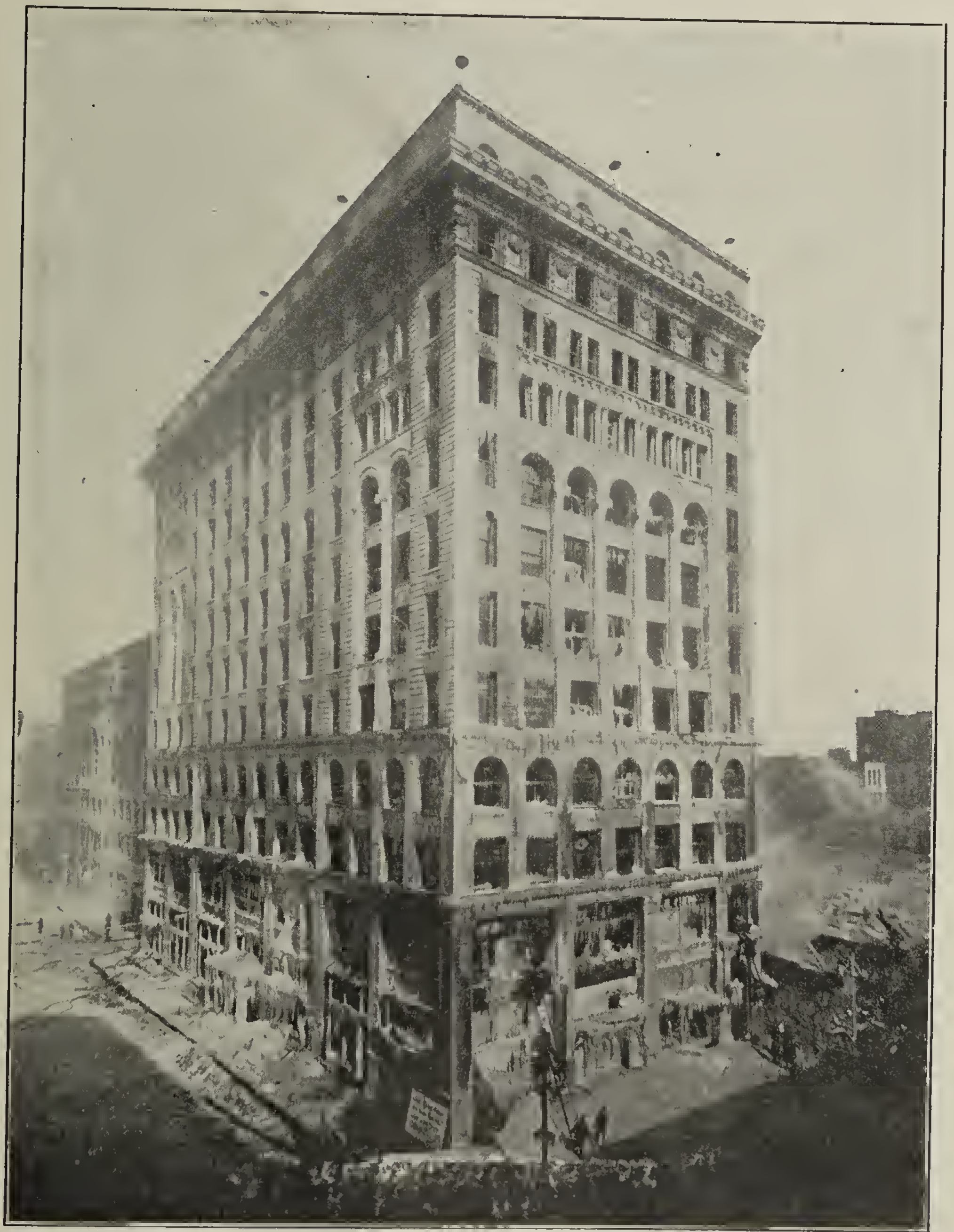
The Granite Building I wish to mention is 70x160 feet, twelve stories high, on the corner of Main street East and St. Paul street; owned by Sibley, Lindsay & Curr Co. They also own at the rear of the Granite Building across Division street (twenty-five feet wide) a building 60x400 feet, seven stories high, known as their "Wholesale Building," used in connection with the Granite Building. They also occupied on the east of the Granite Building a building 60x160 feet, five stories high. The latter building of ordinary brick construction with a marble front and known as the "Marble Building." The basement and first story of the Granite Building and Marble Building have an opening in basement and first story of 50 feet; the second, third and fourth stories have an opening about 10 feet square at the end of hall, used as a passageway between the two buildings.

The Granite Building and Wholesale Building on the north across Division street are connected in the basement by an excavation under the street and by corridors above first story up to the sixth story with openings 10x15 feet on each floor.

The front part of the Granite Building above the ground floor and the rear above the fifth floor, was occupied with offices. The balance of the building in connection with the Marble Building and Wholesale Building was occupied as a department store, wholesale and retail.

The large openings mentioned are for the convenience of the business carried on in the three buildings by the same firm.

The interior of the Granite Building is supported throughout by cast iron columns as well as the large openings. The floors are of flat arch construction; the partitions of 4x4 in. hollow blocks with columns covered as well as all exposed iron work with porous terra cotta fire-proofing. If you can follow me through this description you will see the conditions are ideal for an intense heat, which went up through the building like a roaring furnace, igniting and burning out the interior woodwork (with few exceptions). The hall floors, wainscoting and door casings were of marble;



Granite Building, Rochester, N. Y., as it Appeared After the Fire.

all of which crumbled. The exterior walls are all in good condition. Flooring and partitions are more or less damaged. The iron work has been thoroughly protected. The owners expect to be doing business in this building in a short time.

It is needless to say the marble block, five stories in height, and other buildings in the burned district were entirely consumed.

"The wholesale building above mentioned (60 feet front, 400 feet long) was of brick and iron construction. The filling between beams was with 4x4 hollow blocks, segment arch; all well and substantially built but a few years ago. Owing to the columns not being protected, the building is a total wreck and lying in a shapeless mass, excepting the front, where the heat was less intense.

Inasmuch as the granite building contained in and surrounding it so much combustible material, the structural work has undergone a severe test, that must convince the most skeptic that terra cotta fire-proofing is what the term implies.

The floor arches were of end construction; the shell of material being one inch thick. A considerable portion of the bottom shell of the arches dropped off, owing largely, in my opinion, to the material of which they were made being too porous, thereby losing much of their strength and utility. There is a point in porosity beyond which we cannot go in safety. The harder material has stood the fire much better and, in my opinion, should be recommended in fire-proof construction.

The exterior of the granite building was built of granite four stories and the remaining eight stories of pressed brick, terra cotta and marble, which came through in a very good condition; being on the street fronts, it was less exposed. In some places the marble shows defects.

We can recapitulate the conditions as we find them today and say the fire-proofing material has done its work and saved from total destruction a model commercial building.

Rochester, N. Y., March 19, 1904. W. H. H. ROGERS.

Written for THE CLAY-WORKER.

WHO IS THERE TO MOURN FOR LOGAN?

IF YOU visit the present cemetery on the site of old Fort Hill in the city of Auburn, New York, you will find as its most prized feature an obelisk monument some eight feet square at the base and fifty-six feet high. It is built entirely of rough field stone of that limestone region. About fifteen feet from the ground there is a slab of plain marble set in one side of the monument in which is cut these historic words: "Who is there to mourn for Logan?"

The monument and its marble tablet were placed there a quarter of a century ago by Judge Hall of Auburn. It stands in the site of the fort within which Logan, the Indian, was born. He was a chief of the Cayuga tribe. As an orator this savage was classed by Thomas Jefferson with Demosthenes and Cicero. He had lived a friend to the whites, but in the last year of his life, through an unaccountable blunder, the whites killed his wife and all his children. He went on the war path and he murdered many whites. At the capture of his band in Virginia, in 1744, he wrote a letter to the officer in charge telling why he had committed these crimes. The letter is a gem in diction and in oratorical power. Said he: "There runs not a drop of my blood in the veins of any living creature. This called for vengeance." He concludes with these words: "Who is there to mourn for Logan? Not one."

All admire a beautiful and forceful use of language. The red men have given us not a few examples of such use. Their simple directness and their imagery from nature are most telling in oratory. But in this instance we have just quoted there is a meaning for you and for me today, although we must ask the question in a broader sense. With us it is not merely whether there be members of our family to mourn for us. But, will there be one of our great human family who will mourn for us? Will there be those who have cause to mourn their loss when we have gone hence, to that place the savage calls "the happy hunting grounds?" Has civilization broadened the question without its losing in its intensity? Will our families, our associates, our townsmen, mourn for us? Or must we hire our mourners as do the Chinese?

Again, it is not enough to be and to be known as "a good fellow." Goodness is most excellent, and all should have it, but merely a good fellow is little mourned. No, it is not enough for a man to be good. He must go beyond that and be good for something. There must be some part somewhere of the work the world wants done which he can and does do unusually well. This is the family view, the business view, and the professional view.

Finally, we are all social beings; all should be intellectual beings, and all be interested in right living. Do your part for the sake of doing it and not for pay or fame or to get your name on a program or into print. Do it so that, "tho' they may forget the singer, they will not forget the song." And do it genially, so that you radiate good fellowship and good citizenship. Sacrifice yourself as you ought. God will bless you if you stop trying to bless yourself. And when your summons comes, and the casual passer by shall ask, "Who is there to mourn?" the answer will come from the very air of the place,—"Not one, but many." WILLARD BEAHAN.

Written for THE CLAY-WORKER.

SOMETHING ABOUT ILLINOIS POTTERIES.

THE STONEWARE INDUSTRIES of the State of Illinois have long attracted much attention, in fact, all of the clayworking establishments of that state are attracting more and more attention, but the stoneware end of the clay industry in that state is particularly interesting. Some of the largest potteries in the country, and at Monmouth, Ill., it is claimed, the largest stoneware pottery in the world is located. This is the plant of the Monmouth Pottery Co., of that city.

The clay found in this state is peculiarly adapted to the manufacture of this class of goods, and the earth seems to be rich with good clays of all kinds. In some parts of the state excellent grades of brick and fire clay, while in others the soil is rich with stoneware clay, and in certain parts of the state even the whitest and purest grades of kaolin is found, although this is not very extensive. The state is also rich in other deposits which go to make up certain grades of earthenwares. In several parts of the state the best grade of flint and silex are found in large deposits. At East St. Louis, Ill., a large flint mill is operated all the time, day after day, on the grinding of this material. This is the plant of the Illinois Mineral Milling company. At St. Louis, Mo., a large kaolin plant is operated by Mr. I. Mandle, whose clay is sold as far east as Trenton, N. J., and which is of an excellent grade.

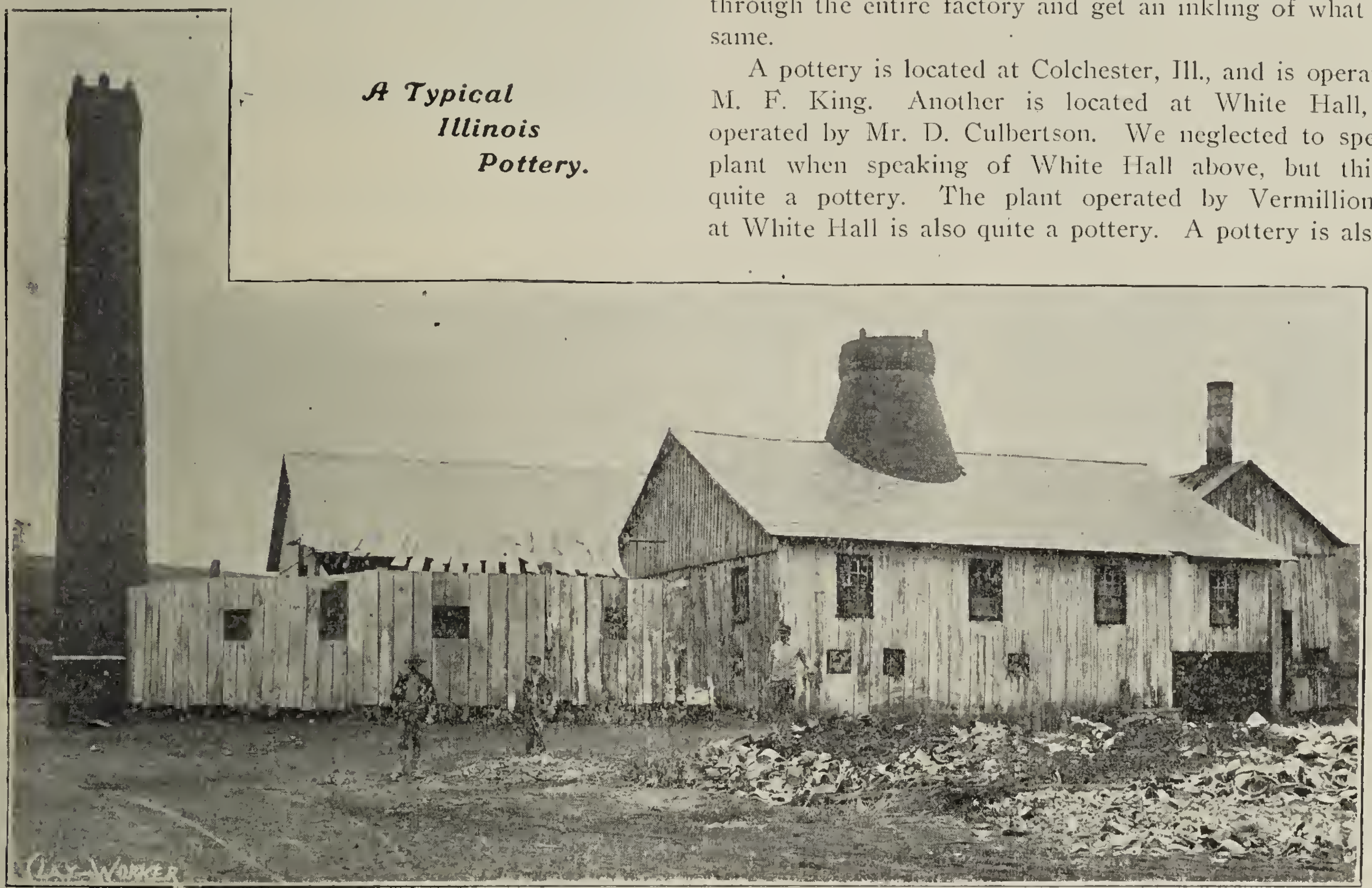
One of the larger potteries in the state, the plant of The Monmouth Pottery company, as stated above, is probably the largest, and the works of The Weir Pottery Co., of the same city, is no small affair and employs a great many hands. This company show a particularly progressive spirit, more than common in keeping with the business, and are bettering the plant each day and are constantly putting upon the market new lines. Their main run is upon their patent Weir fruit jar, on which they run their factory principally. Recently, however, the company installed special machinery for the manufacture of a few porcelain articles, and these are now finding a ready market, and they are producing this class of goods in a rapid manner and are figuring on increasing their capacity for the manufacture of this class of goods.

Leaving Monmouth, we go on to White Hall, Illinois, where we find the works of the White Hall Stoneware company, and also that of The White Hall Pottery Works, the latter of which is owned by A. D. Ruckle & Son, and which is being constantly improved until now they have quite a pottery on their hands. Down at Macomb, Ill., we find the works of The Macomb Stoneware Co. and the Macomb Pottery Co. An interesting feature, we will mention right here, is the fact that when two potteries are in a town they almost invariably take up the same first name with a different ending, such as the ones just mentioned, for instance. This seems funny, as one would think that people would get the two mixed, but it seems that they do not or, if they do, it doesn't seem to make much difference.

These plants are operating largely, also, upon a patent fruit jar, which seems to meet with a ready sale in certain sections. The Buckeye Pottery and that of The Eagle Pottery Co. must not be forgotten. These plants are located at Macomb and are successful plants in the best sense of the word.

Over at Metropolis, Ill., we have a good little plant, known as The Metropolis Pottery Co., which is operating steadily.

Rapp Brothers, of Morton, Ill., have shown a spirit of discontentment with their present business and are moving right along and constantly adding to their works, until their plant is one of the main factories in the state. They have worked hard for the position they have gained, and deserve all they have.



A Typical Illinois Pottery.

Some of the smaller plants are located all over the state, and to mention them all would be almost an impossibility, at least to one who is not personally acquainted with them all or nearly all, as there are doubtless little plants throughout this state whose existence is hardly known, and who probably do not employ over two or three men at most, making all of their ware by hand, and taking their clay as they get it out of the ground and tempering it in an old-fashioned pug mill or sometimes in an old-fashioned wet pan or chaser mill, which is oft-times drawn by a horse, and in some cases even a cruder method is prevalent, that of tempering the clay by hand and with a paddle at hand, although few plants are ever found that this is practiced at. After tempering, the clay is then wedged or slapped, as it is sometimes called. These methods are, however, almost passed out of existence, as the business that is worth running at all is generally worth improving and keeping pace with the times.

But, as we were starting to say, of the smaller plants who, however, have fairly up-to-date plants, may be found in the works of such people as John L. Toler, who operates the Anna Pottery at Anna, Illinois, and who is improving his plant from year to year, and then there is the pottery operated at Belleville, Ill., by Mr. Jacob Hitzelburgher, which is being bettered right along. At Alexis, Ill., the Alexis Pottery is being operated by T. Townsley. Several potteries are operated in the city of Chicago, although these are not, for the most part, stoneware potteries, but in most cases manufacture flower pots, etc. Of these, the plant of Geo. Keller & Son is exceedingly well known. This plant is located right in the city. Other plants are located there, making similar products, and an exceedingly fine plant in this city, although it is a little out of our topic, being a terra cotta plant, is the works of The Northwestern Terra Cotta Co., and it certainly does one good, who is interested in this class of factories, to go and see this plant in its daily operations. It is conducted on large principles and the goods that they turn out day after day are hard to equal, and are seldom equalled. Another plant in the city, although not so large, is really more interesting, at least to a pottery man, and that is the works of The American Terra Cotta and Ceramic company, who are manufacturing an extensive line of terra cotta, ceramics of every description, burial urns, art ware and faience. This plant is a wonderful place and is well worth one's while to go through the entire factory and get an inkling of what they do in same.

A pottery is located at Colchester, Ill., and is operated by Mr. M. F. King. Another is located at White Hall, which is operated by Mr. D. Culbertson. We neglected to speak of this plant when speaking of White Hall above, but this, also, is quite a pottery. The plant operated by Vermillion Brothers at White Hall is also quite a pottery. A pottery is also operated at Tonicá, Ill., by The Lowell Pottery Co., which will be greatly improved some time this winter. A whiteware pottery is also located at Peoria, Ill., and is quite a large pottery. This plant is running along steadily and is owned and operated by The Crown Potteries company, of Evansville, Indiana. There are lots of plants that we have not mentioned, a portion of which have slipped our memory and, if we have forgotten them, we are sorry, as this class of manufactories certainly deserve great credit for the showing they have made in the past, what they are doing today, and encouragement to do more tomorrow.

A POTTERY WANTED IN GEORGIA.

Editor Clay-Worker:

I would like to get into communication with some reliable, responsible and experienced workers in chinaware or porcelain manufacturing, for the purpose of establishing in this section a factory to produce such a product. We have kaolins here in the south which are being shipped north to make this ware. We have here plenty of labor, and, while it is unskilled, it is cheap, and is capable of being taught ordinary work in almost any manufacturing plant. In our new terra-cotta plant just being comreasonable in price, one can work outdoors practically the entire year and, if I can get in touch with the right kind of people who are willing to come down here and invest some of their money, I will find the balance necessary to make a splendid investment. For many years, the South has been raising cotton, sending it north and east, buying back the manufactured products and paying two freights, the manufacturers' profit and a brokers' commission besides. These conditions are rapidly disappearing. Cotton mills are being built all over the South, which manufacture all the grades of cotton goods, which we formerly had to send away to get. The same condition exists with reference to the chinaware used by the eighteen millions of people living in the southern states. Kaolins from Georgia, Florida and South Carolina are being shipped to Ohio and New Jersey, manufactured into pottery, and come back to us in that shape. That condition is bound to change, and I feel that with the right sort of a start we are bound to have a successful issue, and I am going to make that kind of a start. I am now looking for the man or men to help me, and your assistance will be appreciated.

Atlanta. V. H. KRIEGSHABER.

Written for THE CLAY-WORKER.

LESSONS OF THE ANCIENTS.

Remarkable Clay Products of the Assyrians—Examples Worthy of Reproduction and Others That are Not.

IN THE PRACTICE of any art or craft, a knowledge of the achievements of the past should be of much value. This value, however, depends upon the way in which the knowledge is used. Proper and valuable use does not come from the slavish coping of the art of our ancestors. Such is suicidal; it stultifies all progress. The art of past ages should be known intimately, known for the sake of the culture it brings, and because it brings certainty in one's work. It is difficult to imagine one who knows intimately the art work of the world making what is ugly, and inartistic. Ugliness flies before knowledge. The study of the world's art so directs one's artistic sense that ugliness offends, and its production becomes impossible.

In America where artistic work in all lines of building is receiving increasing and serious attention, there is yet far too much copying of the past. We find never-ending attempts to imitate the work of earlier times. This imitation would be bad enough if we only repeated the good work of our forbears, but we do not stop at imitation of good work. We copy also their crudities, their limitations, their lack of artistic sense. It is a small town in which cannot be found at least one house in which is imitated the crude brick, the clumsy joints made with poorly mixed mortar which our poverty-stricken ancestors erected on the Atlantic coast. It is not difficult to assure ourselves that these same ancestors kenw this work was bad and that they only executed it under the stress of adverse conditions. The proof is that when one of them had sufficient wealth he imported brick from Holland—where well-made brick was to be found, and had it set by men from abroad who brought with them material for well-executed joints. Yet we slavishly imitate the work they would have eliminated had they been able.

The proper use of the past comes through the study of mistakes as well as through the appreciation of beauty and skill. Such discriminating study develops our own judgment and sense of fitness. There is nothing which will so surely develop an artistic sense as a study of the art of preceding ages. There is nothing which will so surely stultify our own originality and appreciation of beauty as blind imitation even of good things. To the end of appreciation and general culture we present more illustrations of the brick constructions of Chaldea and Assyria.

One of the most interesting features of Assyrian construction was the battlements which crowned the walls of all buildings, whatever their use. These battlements (Fig. 1) were, in form, exactly those used from the dawn of military or defensive architecture to the time when gunpowder rendered them useless. They were the form naturally suggested to the archer who fought from the top of a wall with bow and arrow. He must have an open space where he could freely discharge his arrow and protection near at hand when he was not actively engaging his enemy. While developed solely for utilitarian purposes, battlements, in some periods, have been used as a decorative motive, but nowhere so extensively as in Assyria. When we recall that the cornice was only developed some centuries later by the Greeks, we may perhaps understand the universality of the use of this form in the buildings by the Euphrates.

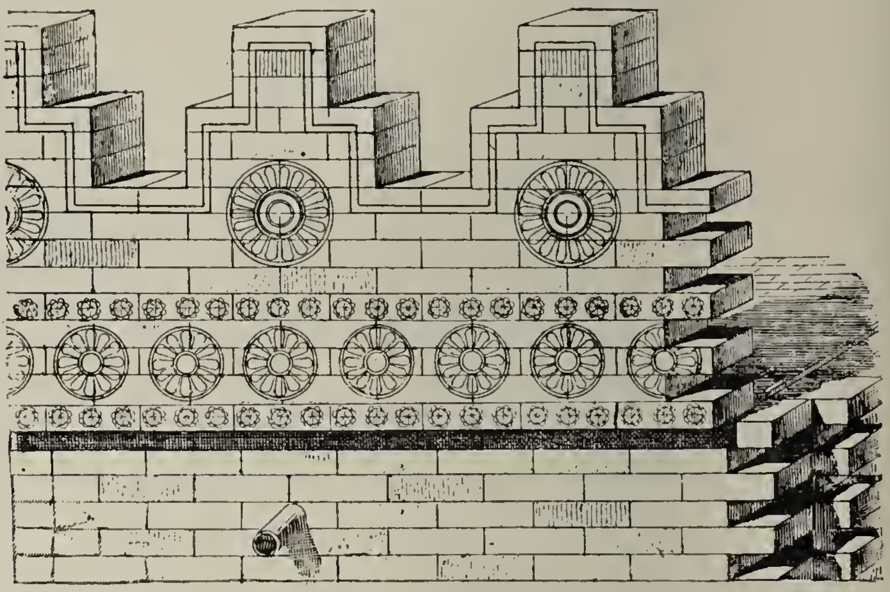


Fig. 1.
Battlements of Sargon's Palace at Khorsabad. Date about 880 B. C. Rosettes in band of ornament and larger ones symbolic of the beginnings of life.

This illustration also gives an interesting example of a simple decorative motive. The rosette form here shown was a favorite one with these builders. As with the Greeks, it was symbolic of the beginnings of life. These rosettes were usually made on blue enamelled brick in white lines. In the clear atmosphere of that country this simple coloring was very effective. In the example given there is shown a rudimentary cornice made by a projection of the wall of from one to two inches. This gave a little shadow line which emphasized the decoration as well as broke the flat surface.

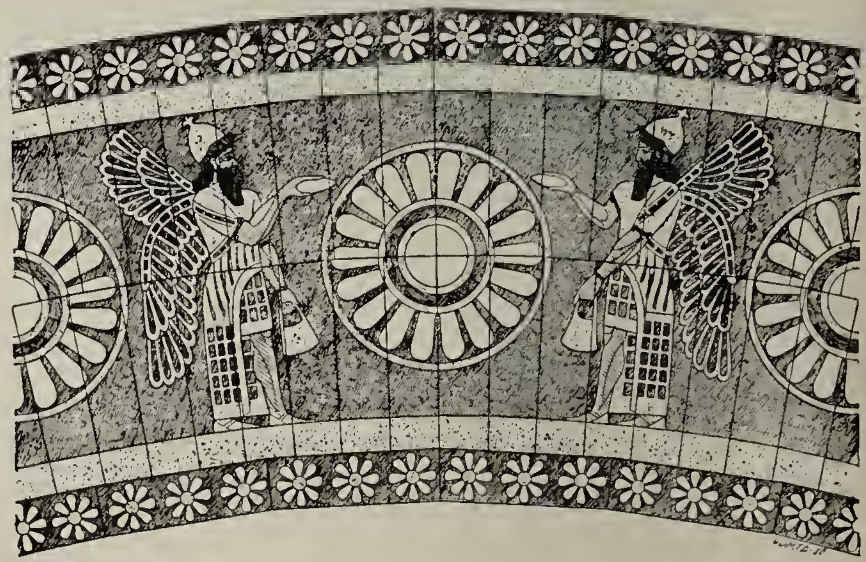


Fig. 2.
Part of enamelled archivolt at Khorsabad. Date about 720 B. C. Each figure covers several bricks, which were assembled after burning.

The Assyrian architect, like the Egyptian, was lavish in his use of surface decoration on the exterior of his building. This decoration was universally in enameled brick or tile and was usually symbolic in character. Stone decoration was rare, because stone was only to be found in the mountains to the northeast. To be sure, had the Assyrians preferred stone to enamelled brick they might have secured it without excessive labor, not appreciably more than the Egyptians of the north expended in bringing to their temples the superior stone of the south. The Assyrian probably used brick because he preferred it, because the forms and colors he secured in this material better suited his artistic sense than did the stone. No nation has ever done so much and so good work in brick and tile as the Assyrians and their successors the Persians. The sole direction taken by their architecture was that coming from the use of burned clay.

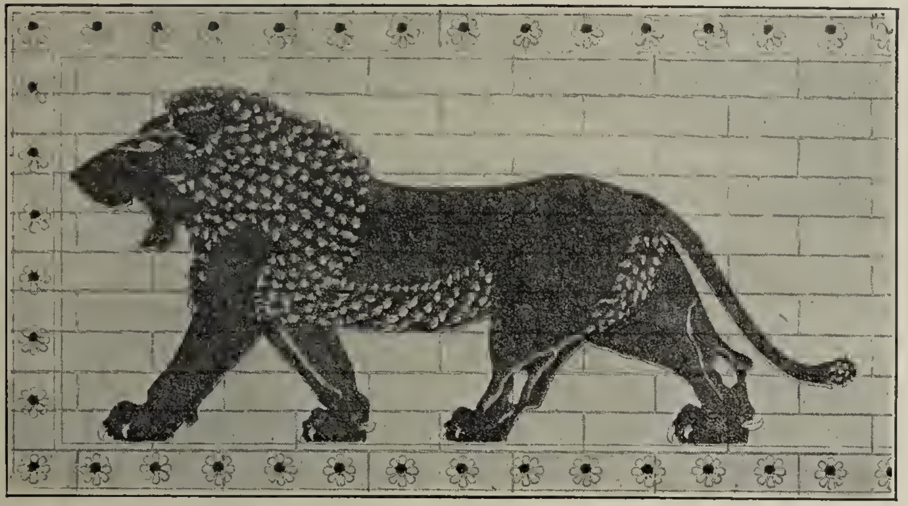


Fig. 3.
Figure of lion from Harem at Khorsabad. One of the most noted figures from that celebrated structure. Date about 720 B. C.

It was about the doorways of their buildings and about the gateways of their city walls that this decoration was the richest. Fig. 2, on opposite page, shows a part of an enamelled archivolt which spanned one of the city gates of Khorsabad. Here, as in the battlements, the ground is blue, the rosettes white. The figure is one of the protecting Genii of the city. In color it is mostly white and yellow with enough green and black to emphasize and strengthen the lines and relieve the whole from monotony. The bricks from which this decoration is made were enamelled on one edge only, and were porous in texture, as were all of the burned clay products of this country.

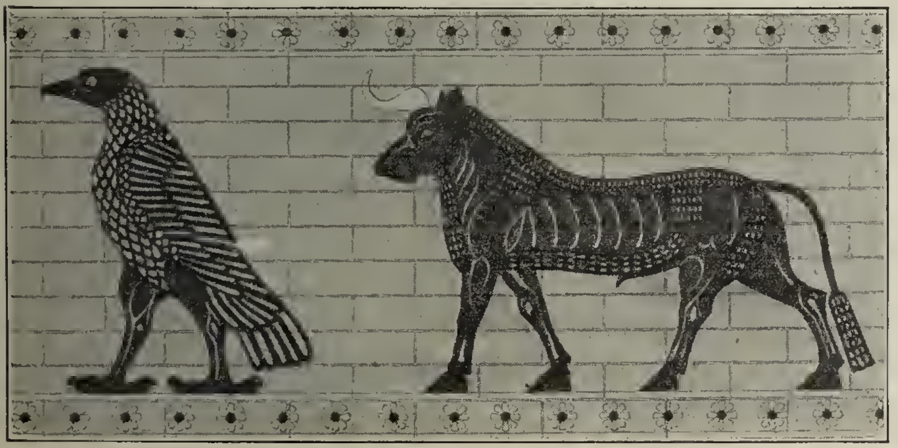


Fig. 4.
Enamelled bricks from the Harem at Khorsabad. The color is exceedingly rich, although in three primary colors only.

The figure shows the strength and boldness which always characterized the drawing of the Assyrian artist. The work of this people is noted for a certain virility which characterized it beyond that of other nations. This boldness was obtained at the expense of refined insight which showed in Grecian work. It is possible that delicacy might have been developed later had the Assyrian civilization been allowed to develop to its full. The Persian conquest destroyed all hope of further advancement along the natural lines of the Assyrian genius. While their reproduction of the human figure were of noteworthy excellence, their rendering of animals was unusually strong and full of action. In judging this art we must constantly bear in mind that it was one of the earliest forms of which we have record and was necessarily crude, as all new art forms are; but it was vigorous and expressive in large measure of the characters of the animals pictured. In Fig. 3 the ground is blue and the lion principally in chrome yellow. The fact that these animals were not depicted in their true colors, but in the tints which lend harmony to the color scheme of the decoration of the structure has been criticised rather severely. However, had this been done unity of decorative effect would have been impossible; there would have resulted a hodge-podge of color and form. The Assyrian was artist enough to hold to a simple scheme of color. Perhaps these artists' most successful decoration consisted of geometrical figures in which they were entirely free in the choice of colors.

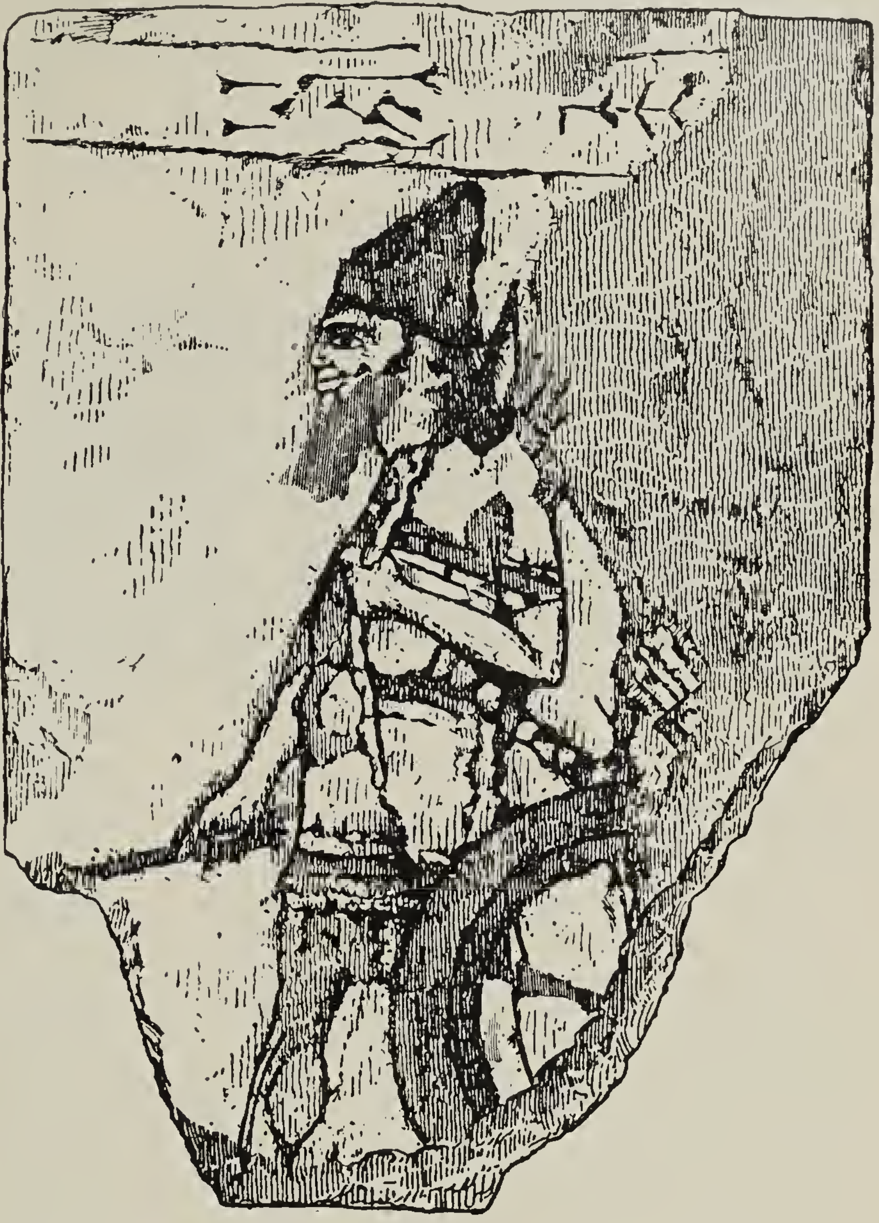


Fig. 5.
Figure of soldier from knees upward, armed with bow and lance and standing by wheel of chariot. Inscription at top was continued on next brick. Date about 720 B. C.

In a country where there was no stone and little wood it was natural to build tombs of brick. It took a certain kind of ingenuity to build a tomb such as is shown in Fig. 6. Here was laid a brick pavement on which the corpse was stretched, and the whole covered with an immense lid of terra cotta—a sort of crockery-ware tomb. The lid was made in several pieces cemented together with reeds soaked in bitumen. These tombs were in various forms more or less elaborate. The corpse was invariably laid therein without a coffin and by him were placed jars of water and food. There were less pretentious places of sepulchre which consisted not of tombs, but of coffins laid in the sand. These were often two cylindrical jars about two feet in diameter, one of which was placed over the head and the other over the feet of the corpse, the joint in the center being sealed with bitumen. The bodies of children frequently were placed between two hollow terra cotta plates. The skeletons found in these tombs and coffins have been preserved from forty to sixty centuries, proving the permanency of burned clay as a place of sepulchre.

These tombs are found, not in the alluvial soil which borders the Euphrates river, where are situated the cities of Assyria, but in the great sand plains far to the southeast. These plains seem to have been considered consecrated ground to which were carried in solemn pilgrimage the bodies of the entire nation. No trace of burial has yet been found in Assyria, while the uninhabited sand plains of the south are covered with mounds, and every mound a tomb.

The uses to which the Assyrian put clay, burned and unburned, seems numberless. If a deed to a piece of property was executed, the written characters were incised on a sheet of clay, the clay burned and filed away for future reference. If a letter was to be written it was incised on soft clay and usually sent without burning. By the roadside sat the professional letter writer with his sheets of prepared clay and sharp-pointed tool ready to take at dictation letter or legal document. Libraries consisted of books of burned clay. At Khorsabad were found hundreds of thin sheets of burned clay carefully laid in neat piles waiting to be read by the frequenter of the public library of that city. Letters and documents of all kinds were signed by pressing metal or stone cylinders into the clay, these cylinders taking the place of the signet ring of a later period.

LOUIS H. GIBSON.

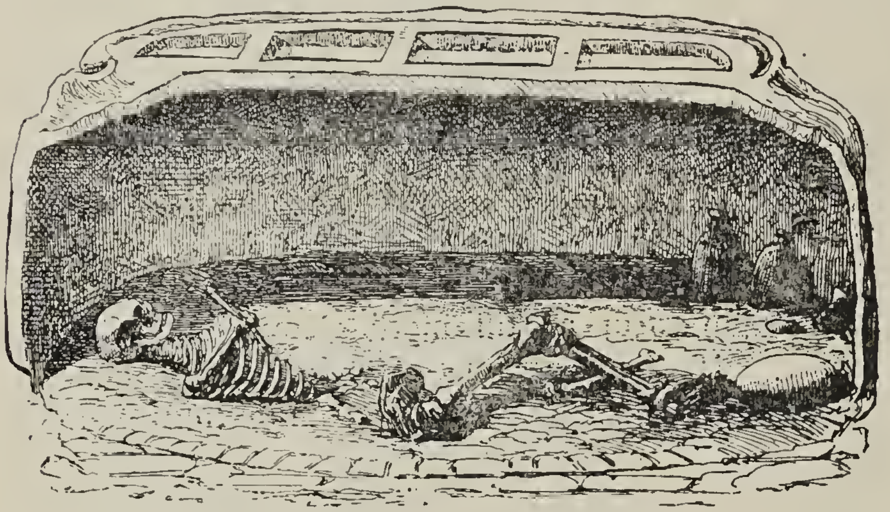


FIG. 6.

Tomb at Mugheir. Date unknown. 7 ft. high, 3 ft. long and 3 ft. wide. Terra cotta lid formed of several rings, decreasing in thickness with their distance from the ground. Water jars shown in background

A Convention Echo—Vice-President Root's Opinion.

My Dear Randall—It was not until Sunday that I left Cincinnati and I started South on a short trip. There were still a half a dozen or so at the hotel and they seemed loath to go after the many good things they had seen and heard during the Convention week. Every matter discussed was worthy of careful consideration and the more I think over the last Convention the more I am impressed with the success of it. All who were there have reason for pride in the work of the N. B. M. A. It was a great Convention in numbers, for I understand that there were nearly four hundred buttons issued.

I missed the Connecticut and other New England people and am sorry that I did not see them. The programme was the broadest and best ever discussed, covering all the ground that any one connected with the brick manufacturing business could desire. In fact if the delegates did not get all the information they wished on clay, shale, or sand-lime brick, it was because they were too modest to ask for it.

The entertainment committee of Cincinnati deserve great credit for the way in which they took care of the visitors, and the ladies in particular are echoing their praises. Indeed, I want to say that all the members and you especially have reason to be proud of the Cincinnati Convention. I for one am very glad I was there and hope to be able to attend many more in the future.

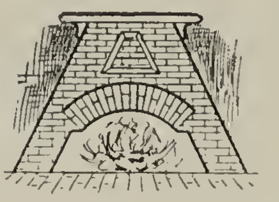
Yours very truly,

Princeton, N. J. A. R. ROOT.

Written for THE CLAY-WORKER.

THE MODERN CLAYWORKER—No. 11.

THE KILN—CONTINUED.



APPROACHING FEASTS in the way of Convention Articles, which fill the clay magazines from January to March caused the writer of the Modern Clayworker articles to desist from his efforts to interest until some more propitious moment.

We left off talking about furnaces, grates and the like and took up sparingly the question of kiln insides. The patch through a kiln is seemingly open and plain to all and on first thought seems a matter of small consideration, after the question of furnaces is decided upon.

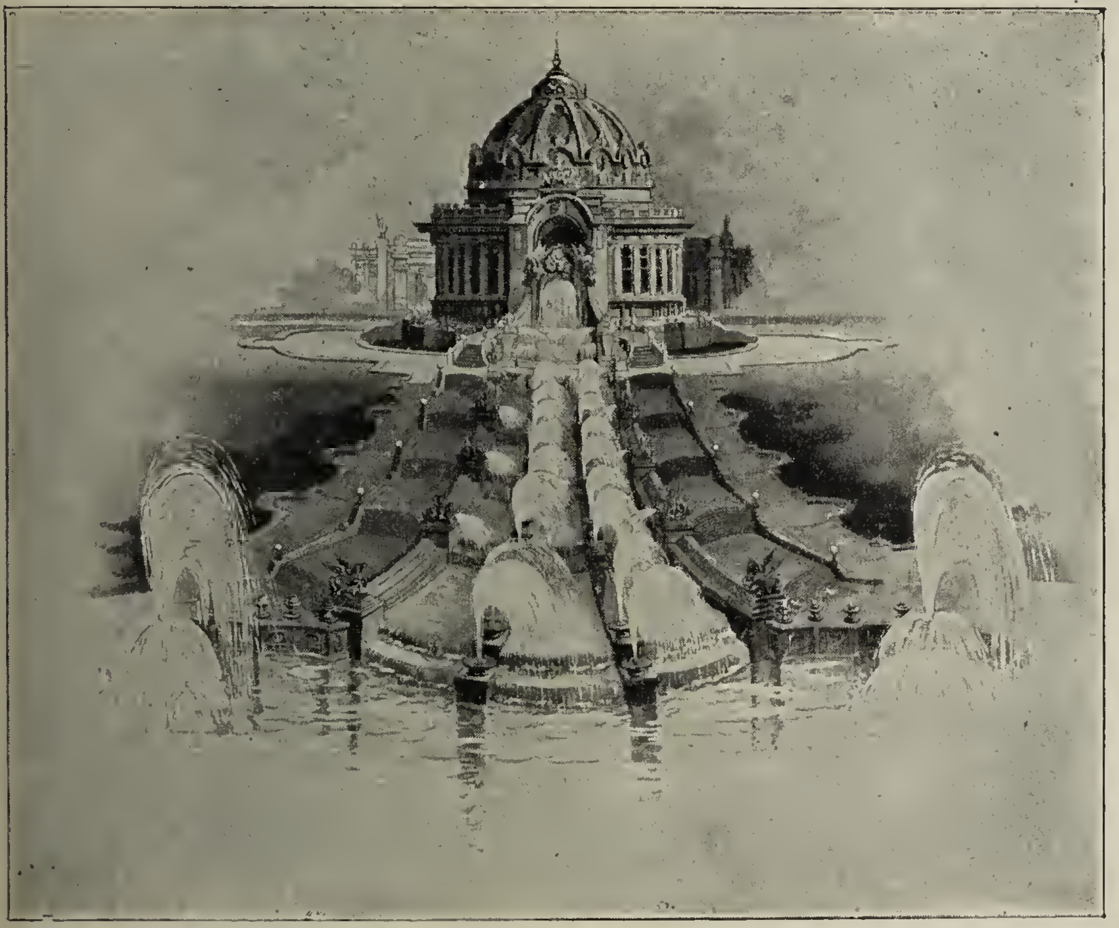
A kiln chamber is usually considered as so much space, more or less, in some instances depending on the financial ability of the builder and in others on the result of experience. Mr. Jones (no post-office) firmly believes there is no economy or sense in any kiln but a round kiln with an inside diameter of not over twenty feet, and he clinches his argument by saying that his neighbor Smith uses a thirty-foot kiln, has exactly the same design of kiln, uses the same grates and fuel, has clay that is precisely the same as his and has burners of the same experience. Jones shows a fairly good burn, without considering the cost, with possibly not more than 10 per cent. of soft ware on the outer edge and a fairly even product throughout the small kiln area. Neighbor Smith has soft brick ten to twelve courses up and a very small hard brick on top and twisted ones near the fires. A portion, perhaps 30 per cent., are about right. Now it is plain to see that the firm of Jones & Smith would not lay up much of a bank account. Jones thinks he is all right, but he is limited in observation or is convinced when he goes away from home and sees a 36-foot round kiln doing as good work as his little 20-foot kiln, that the explanation lies altogether in the clay.

Why do Jones & Smith continue in their error, or rather what is their remedy? It does not seem to lie within themselves. Knowledge is, of course, what is needed; knowledge of kiln construction, knowledge of firing, knowledge of heat distribution and circulation is what they need. Unfortunately such knowledge has to be purchased, and the way lies toward the Kiln Man, the Ceramic Engineer and the graduate of a school of Ceramics. Which? The kiln man may accomplish the desired result, and he may not. He may not be capable, that is, may not have the kiln needed, and he may have an excellent kiln but one that will not work itself. He will generally need the assistance of good brainy burners. On the other hand, he may have a kiln which will do good work burning any common ware from any clay that can be burned successfully, and that with ordinary intelligence. He should be allowed to follow up or check up the first few burns to see if the burners are the right sort. This means personal attendance and is expensive to consider, but should be considered. The Ceramic Engineer is not a common article. Usually the professional office will not make returns that the man can afford in giving up the regular position which is nowadays open to the proficient clay man. As a professional adviser his charges are of necessity high, and it naturally follows that he is called on in most cases for installation of the large capacity plant or the reorganization of the large and poorly installed or poorly managed plant. His advise is valuable directly in proportion to the good results he has had in the practical operation of plants under his charge or direction. The Ceramic school graduate is a growing source of remedy. He is quite available. He has a large store of technical knowledge and he is in a position to take on ideas rapidly and without prejudice. He has his spurs to win and is consequently ambitious and careful. He is of an investigating turn of mind. He can apply theory to any proposition which may come up. He can turn the kiln man down if his claims are bogus; he can safely welcome him if he has a good idea. If he is a man who quickly takes in a business idea, he is quick to see that if he needs specialized assistance, and by buying such assistance can quickly save his employer fuel, time and more even burns, he has demonstrated his own worth to his employer. If he can sort out the wheat from the chaff in the patent kiln field; if he can determine theoretically whether a kiln idea is good, if he can do this he is demonstrating again that he is of more value to his employer than if he would use up a thousand dollars' worth of his time in figuring out a kiln which would perhaps not equal what he could buy for five hundred dollars.

Kiln doctoring is needed in many instances, though the insides are apparently open and free and digestion (burns) is fairly good. As with the human body, which sometimes disposes of material satisfactorily, assimilation is poor, and this is true with kilns. Burns are accomplished, but at the expense of fuel, and the owner is not nourished by the profits.

In many kilns there is a bad case of appendicitis or obstruction, and an operation is necessary. To speak more strictly in kiln terms, kiln drafts want to be so divided that the distribution of heat is a certain proposition. Whatever a man in search of a kiln is lead up against, let him look well into this matter of divided draft force, which is the only economical means of distributing heat. We are considering here the present-day common method of burning in small or unit kilns.

The day will undoubtedly come soon when burning economy will be considered as it should be today, without so much attention being paid to economy of first cost. As a rule we are asking unreasonable things of heat. We expect it to be cool in one place and hot further away from its source. We expect to draw it down with less of a force than that of its own bouyancy. We expect it to skip, dance and turn of its own free will and through all the great mass of clayware we expect heat absorption to be equal.


Festival Hall, World's Fair, St. Louis.

The proper handling of heat means that there is a necessity for a limited amount of work, or progressive work, progressive through different degrees of heat and always toward an advancing force. In such conditions we get absolute heat economy or the continuous kiln.

Up to the present time we have had no satisfactory substitute for the continuous kiln. The down-draft kiln cannot be said to be an instrument of economy in itself, yet by the assistance of the system of waste heat drying the conditions of economy found in the continuous kiln are closely approached by the properly constructed down-draft system of kilns. The tendency toward lower setting and wider area should be encouraged or put in practice. On the face of it there may perhaps not seem to be economy in low setting or low kiln walls. If we admit, which we do not that there is no direct fuel economy through low setting, we have to consider the resultant economy in wares that are evenly and well burned in the minimum amount of time. Where one cannot install the continuous kiln it is no doubt a more simple proposition, and the writer believes a better one, to use round kilns, that the area may be increased as the height is lowered. In a limited number of experiments by the writer it has been demonstrated that low setting in kilns built for high setting accomplishes no fuel economy, but gives a better average result. For instance, we will take a kiln capable of holding 80,000 brick when set thirty-six feet high, and say for convenience that for the burning of pavers or face brick that it requires 80 tons of fuel to burn, and when the setting is lowered and 60,000 are set and 95 per cent. of No. 1 brick are obtained with a fuel expenditure of 60 tons, against 85 per cent. No. 1 brick in the 80,000 setting, economy has been effected.

FESTIVAL HALL.

FESTIVAL HALL, the biggest auditorium on the World's Fair grounds, stands just in front of the art palace at the head of the main cascade, on the top of Cascade Hill, at the center from which the avenues of the Exposition's main picture radiate like the ribs of a fan. It is one of the most ornate buildings on the Fair grounds, although it is small compared to the big exhibit buildings. The appropriation for it was $250,000. Its architect is Cass Gilbert, of New York and St. Paul, who was also the architect of the Art Palace. The dome, which will crown Festival Hall, will be the largest on earth, 165 feet in diameter, excelling in size those of St. Peter's Cathedral and the Pantheon, at Rome. These have hitherto been the largest domes in the world.

Festival Hall is a circle with a large oblong rectangle at its southern end. The circle has a diameter of 195 feet. The rectangular oblong is 250 feet long and 64 feet wide. It is intended that this oblong shall contain the stage and the accessory dressing rooms. The gigantic dome is topped by a seated sculptured figure. Below the dome is a large cylindrical drum two stories high. The upper story is pierced by a row of oeil de boeuf, or "bullseye" windows. Below the drum a beautiful engaged Ionic colonnade, 42½ feet high, surrounds the building.

The rectangular construction at the back of Festival Hall joins perfectly the decorative screen or colonnade of states which runs in quadrants to the east and west. The columns of this screen are only 34 feet high, but are in perfect harmony with those of Festival Hall.

The total height of the building is 190 feet. The interior of the hall was designed by Chief-of-Design E. L. Masqueray. It is beautifully finished like a first-class theater with extensive balconies. It seats 3,500 and contains the largest organ on earth.

The Department of Music of the Exposition has charge of the structure during the fair. High class concerts and great operatic performances will be given within it.

The Clay-Worker Always Welcome.

Editor CLAY-WORKER:

Inclosed you will please find $2 for another year's subscription to THE CLAY-WORKER. As long as I am a manufacturer of brick, if only on a small scale, I want THE CLAY-WORKER to be a visitor once a month.

Don't forget to drop in when you are on this way.

New York. THOMAS KIERAN.

ON THE ROLE PLAYED BY IRON IN THE BURNING OF CLAYS.

By Professor Edward Orton, Jr., E. M.,
Columbus, O.

[Reprint from the transactions of the American Ceramic Society.]

THE FUNCTION OF A PAPER before a society like our own, is twofold. On the one hand, it is to set forth matters of scientific truth, as brought out by investigations in the laboratory or in practice. This is its largest function. On the other hand, it is to stimulate others to study, and to investigate and make known their findings, by placing before them the many fields which remain yet untouched by the representatives of modern science. It is to this end that this paper is directed; no original research has been made to explain its problems, and it is more a query than an affirmation. It simply represents the personal views of the writer gathered by observation in factory and laboratory practice, during the past decade.

The presence of iron in all clays is one of the factors which gives clayworking its fascination, for to this element is due the wonderful capacity for variation which characterize clay products above all others. It is a source of wonder that one element can be capable of producing so vast a variety of effects. The more one studies them, the more marvelous do they become.

When we come to analyze the situation, we soon reach the conclusion that this variety is due to a number of different things, acting in combination. Certainly no single variable could account for the facts. And these influences, so far as known, fall naturally into two classes.

First. Variations in the composition and properties of the clay as regards its iron content.

Second. The treatment of the clay in the burning process.

The natural quality of the clay itself is subject to control or modification to a certain extent, by the clayworker. The more valuable products, like pottery and encaustic tiles justify incurring expense in the preparation of the body, and thus the control of the color, hardness, shrinkage and strength may become very perfect. But for bricks, terra cotta and hollow-wares, the great constructive products, which are used on a tremendous scale, such care in preparation is financially impossible, and we are substantially dependent on what nature has prepared for us.

The treatment of the clay in burning is to a very much larger extent, a matter of choice or skill on the part of the clayworker. He can not change the character of the clay in most cases, but he can nearly always change the treatment of it in firing, and he can thus often accomplish good results where the clay is itself of poor quality.

VARIATIONS IN COMPOSITION AND PROPERTIES OF CLAYS AS TO IRON CONTENT.

These variations when considered in detail admit of a four-fold subdivision: First, variations in the amount of iron present. Second, variations in the size of grain, or state of distribution in the clay. Third, variations in the mineralogical form in which the iron appears in the clay. Fourth, influence of the minerals accompanying the iron in the clay.

There may perhaps be still other things which go to make up that marvelous and elusive thing which we recognize as the character or individuality of the clay. But, so far as the influence of the iron is concerned, the four headings above undoubtedly account for most of the phenomena with which we come in contact.

Variations in Amount of Iron Present.

Variations in amount are the first recourse to which writers have turned in endeavoring to explain the color phenomena of clay burning. It only takes a superficial acquaintance with the subject, however, to find that this factor is much overrated in importance, compared with the chemical condition of the iron before and after burning, and its physical distribution in the clay.

In general, we may say that no clay is free from iron. The amount may be truly insignificant, as in the purest white kaolins which sometimes only show a few hundredths of a per cent., or it may rise to such proportions that the clay ceases to be regarded as such and is valued as an ore of iron. The clay-iron-stone of England and the paint called ochre are cases in point. But the usual proportions are far removed from either of these extremes, and are sufficient to destroy the white color of kaolin on the one hand, and the fine red color of the iron oxide on the other.

Seger has covered this field, as he has most others in the ceramic world, and has shown that clays should be divided into three well marked classes, as regards their iron contents, viz: the white-burning, buff-burning and the red-burning.

White-Burning Clays. Without going fully into the conditions which have brought these things about, we may say that the white-burning clays represent those rare conditions, where a rock low in iron has weathered and broken down into a clay, without the intrusion of iron-bearing water or sediments from neighboring rocks. Such a combination of events does sometimes happen, and hence we sometimes find clays which burn white. But since they can only grow by the weathering of igneous rocks, they come almost wholly from the mountain districts, where granites and similar feldspathic rocks occur.

Since transportation of clays in streams is almost certain to result in the blending of iron-bearing sediments with them, it follows that white-burning clays in the vast number of cases are primary, viz: found on the site where they have first been formed by weathering. But, in some few instances, as in the Florida kaolins, white clays have actually been transported over long distances and redeposited as secondary beds, without collecting enough iron to throw them out of the white-burning class.

The rarity of the conditions producing white-burning clays naturally makes them a very small item compared with the vast bulk of other clays. They probably comprise only a few hundredths of a per cent. of the total clay of the world. Their economic importance is in proportion to their rarity, however, and they have thus become a commodity of much value, ranging in price up to $10 or $15 a ton for the choicest grades.

White-burning clays carry from a few hundredths of a per cent. of iron to considerably over one per cent. The more ferrugineous contain much more iron than the purer grades of the buff-burning clays, whence it is evident that quantity alone is not a sufficient explanation of the color.

Red-Burning Clays. It has been shown that it is a rare and unusual event when a primary rock breaks down into a clay, or a secondary clay is built up from floating sediments, without becoming stained with enough iron to bring it out of the white-burning class. In fact, the vast bulk of igneous rocks are ferruginous, and break down into red-burning clays when they weather.

But the remarkable thing in this connection is the regularity of the iron contents of red-burning clays. Of the known clay strata, the shales, the glacial clays, and the alluvial clays comprise the enormously preponderating quantity; probably 99 per cent. of the whole. And in this great mass, the ferric oxide remains ordinarily between 4 and 7 per cent; occasionally it rises to higher figures. Rarely, under the influence of local causes, it becomes iron ore. But shales from every state in the union, and from every country of the world, the loess of the Mongolian steppes, the glacial clays from Arctic and Antarctic regions, the alluvial clays of the Nile, the Ganges and the Amazon, are colored alike with this uniform and ever present constituent.

The explanation seems to rest on the fact that iron composes a small per cent of the known elements of the earth's crust, and as fast as it is unlocked from its combination in the plutonic rocks which make the shell of the earth, it tends to undergo a concentration in the shale-clay strata. Its fineness and lightness in the form of ferric-hydroxide, which it takes on oxidation, prevents its retention among sands to any large extent. Consequently sandstones contain less than their share of the total iron. Likewise limestones accumulating from organic sources in clear water, usually are low in iron. But the shale clays, being composed of the finest sediments, the sludge which travels farthest and settles last, naturally contains the bulk of the ferric-hydroxide, which is equally fine and equally difficult to settle.

The origin of the shale-clays, then, is thought to explain their uniformity of color, and the intimacy with which their iron contents have been blended into the other ingredients of the clay. And from the weathering and erosion of the shales, the vast bulk of the glacial and alluvial clays have come, so that we may predict with considerable confidence that red-burning clays, whatever their age or present location, contains between 4 and 7 per cent of ferric oxide.

The red color of red-burning clays is not in proportion to the iron contents however. That is, many clays containing 4 or 5 per cent. of ferric oxide burns as fine a red color as others containing 7 or 8. Here again, the distribution seems more important than the amount. While we do not find clays burning red without some considerable iron in their make up, we do not find all clays burning red which contain this amount of iron.

Buff-Burning Clays. This group is less clearly understood than either of the others. In amount of iron content, it varies from 0.50 per cent. to 4 or 5 per cent., ordinarily being about 1.5. It overlaps both the preceding groups. White-burning clays burn white because they contain so little iron. Red-burning clays burn red because they contain so much iron. But Buff-burning clays do not burn buff because of the exact amount of iron they contain. Often they might burn either red or white, so far as the iron content is concerned. Obviously, quantity alone is a less perfect explanation for this group than for either of the others.

A discussion of their origin leads too far at this present point. Suffice it to say that there are certainly two sorts of buff-burning clays, with different histories, and whose color proceeds from different causes. In both, the color is thought to be due to the chemical influence of other elements on the iron oxide.

Variations in the Size of Grain or State of Distribution of the Iron.

The powerful influence of the physical factor is well realized by all who have tried to stain clays artifically to some particular tint. Iron oxide in masses of appreciable size becomes red on calcination at a low temperature, changing gradually to a bluish or violet black as the temperature increases. When added to a clay it appears as dark colored grains in the matrix of the clay, which is itself changed little or none by this addition. Even when we grind ferric oxide to an impalpable powder, and distribute it into a clay most perfectly, it merely causes a darkening or browning of the color, nothing like the buff or red colorations of natural clays.

The failure of these simple synthetic attempts to produce iron colors in clays leads us to a study of the condition of the iron in natural clays. We find two states easily distinguished. First, the precipitated or colloid form, whose fineness exceeds all methods of measurement and which we may fairly assume to be almost molecular. Second, the concretionary or granular form, in which its grains or crystals are of appreciable size.

The precipitated form is necessary to the development of either a buff or red color. We may easily verify this by precipitating artificially some ferric hydroxide into a fluid slip of clay. It is possible to produce colors as uniform and as free from specks as natural clays, but it is not possible to get some of the tints of natural clays or to get as much color for the amount of iron used as is developed by nature's methods. As shown in discussing the origin of the shale clays, the iron has been associated with the clay minerals from the very time of formation. The primary clay was usually deeply stained by the solution of iron which formed with it. The soft gelatinous hydroxide has enveloped its grains from their very origin, and left each tiny particle covered by its coloring film. Every succeeding process tends to increase this uniformity, grinding, transportation, erosion, deposition in swamps, all tend to increase the iron and to reduce its blend to perfection.

Thus in the ordinary red-burning shale-clay, for instance, it becomes impossible to distinguish the hydroxide from the clay minerals. The sand, and the mica, and the concretionary minerals of all sorts, can readily be separated by screens or by sedimentation processes, but the pulp which remains inseparable to the end, contains the bulk of the iron, and is red-burning, while the coarser matters which have been separated out, may burn light or dark or speckled, but hardly red. In fact the question has been raised as to whether iron is not chemically combined as a part of the clay substance. No proof of this view has ever been attempted, and all the evidence obtainable points the other way. For instance, dilute hydrochloric acid will take out nearly all the iron from a red-burning clay, leaving a residue in which the clay substance has not been sensibly attacked and which burns light colored or white. If the iron were a part of the kaolinite, its withdrawal would leave the molecule decomposed, and the alumina also would then dissolve, as its bond with silica would be broken. But such is not the case. Hence, while we can readily see how such a view might be suggested by the extreme intimacy of the mixture, and the uniformity of the color produced by it, still it cannot be defended as a scientific fact.

But here, again, we reach a point where qualification becomes necessary. The occurrence of the iron in infinitely finely divided form is necessary to the development of either the buff or the red color. But, the presence of iron in this form, even in connection with the quantity, does not in itself necessarily cause the red or the buff color. The addition of even a little red clay slip to a buff slip will produce a body which burns salmon or flesh color or terra cotta, while other buff bodies may easily be found containing twice as much iron as the experimental mixture contains. Thus it appears that each clay is buff or red as the case may be, from some cause other than the amount or fineness of distribution of the iron.

The concretionary forms of iron in clays include all particles which were not in the jelly-like or colloid state when they entered the clay or which have been drawn together into masses by the obscure forces which we call crystallization or concretionary growth. It does not matter what the force has been which collects iron into granules or what the history of the granules of iron in a clay has been. The mere fact that it *is* in granules, is sufficient to determine its effect.

In general we may say that its coloring power is almost nil. That is, its power to color the matrix or real pulp of the clay. It will produce colors in the broad sense, for we add iron to buff-bricks to make them into grays or speckles. But the change in color is due to alternations of black and buff, and not to a blending of colors, or, the formation of a new color. This segregation of the iron of a clay into granules, is the cause of much trouble to the clayworker. With this trouble comes some benefit. The trouble consists in speckled, spotted, pimpled, rough and unsightly ware. The benefit comes from making a virtue of necessity and creating a market for such speckled and mottled color as concretionary iron will produce. The face-brick industry has shown a wonderful example of this in the last 20 years, and now millions of mottled and speckled and gray bricks are produced with good artistic results. Yet, the real reason for their appearance was the inability of the clayworker to always avoid such manifestations in his wares.

We find that even concretionary grains of large size do contribute some little to the color of the body-matrix of a clay, when the firing temperature becomes sufficient. The iron assumes a silicate combination, and permeates the surrounding matrix, forming a ring or shell of yellow or red or black color, whose size depends on the fluidity of the iron silicate and the duration of high temperature. But, practically speaking, concretionary iron is not responsible for the colors of clay.

The Mineral Forms in which Iron occurs in Clays.

The ferrugineous minerals which are most commonly found in clays are:

(a) Ferric oxide, anhydrous, or in various stages of hydration.
(b) Ferrous carbonate.
(c) Ferric sulphide or pyrites.
(d) Ferrous silicate minerals, like biotite, hornblende and many others.
(e) Ferric sand minerals, like magnetite, menaccanite, chromite, etc.

The two latter divisions do not contribute any large quantity of iron to ordinary clays, probably not over one per cent. and generally much less than that. They are represented by small amounts in all clays, but they affect the clay chiefly by forming minute black slag spots or black specks in the ware, according as the heat has fused them, or left them unslagged. It is from the three first minerals, therefore, that we derive the principal beneficial or detrimental effects of iron.

These three minerals are sometimes all found in the same clay and it can not be said that any one is confined to any particular kind of clay. Still, some sort of classification by location is possible.

In the following discussion, consideration will only be given to the secondary clays, which compose the bulk of our clay wealth. The primary clays, although they include nearly all of the white-burning kaolins and china clays, form such a minute part of the vast masses of clays in general, that they need not be considered in this discussion, and the red burning primary clays are of small economic importance.

Among the secondary clays those of recent geological age, like the alluvial clays which cover the present river valleys and bottoms, almost invariably contain their iron in the form of ferric oxide or hydroxide. Ferric sulphide and ferrous carbonate are not unknown in such clays, but they are quite unusual.

In the next group belong the glacial clays, which were deposited like a blanket over the northern half of this continent, by the great ice cap or continental glacier which invaded us from the north in recent geological times.

The rough hilly country was covered with this ice sheet, the tops of the elevations ground off, the valleys filled in with the debris, and over all, as the ice retreated to the north again, the great sheet of clay was left behind to form the soil. In view of their origin we can not expect glacial clay to be uniform in any respect, either in size of the mineral particles, or the kind of minerals represented, or their chemical condition. And the facts justify this view, for no sedimentary beds vary so widely in character as those laid down by the ice.

In the glacial clays, ferric hydroxide predominates; especially is this true on the surface. But, when deep cuts are made into glacial clays, we not infrequently find them taking the form of blue, tough, adhesive hard-pan, in which the iron is ferrous carbonate. It may be fairly said that time has elapsed since the glacial period, to convert the iron salts of the deeper strata into ferrous forms. But, in many cases, the other conditions did not favor the change. Hence, while ferrous beds are common, at times almost reaching the surface, they are more often found deep under cover.

Clays of ancient origin, such as the fire-clays and shales, contain their iron most commonly as the ferrous carbonate or the sulphide. The reason for this is clear. Nearly all such strata contain, or have contained, more or less carbonaceous and sulphurous matter, and during the enormous periods of time since their deposition, have been subjected to bacterial action, heat, and pressure The reduction of the iron, and its combination with the CO_2 and S thus produced is a natural event under the circumstances.

All fossil clays are not necessarily ferrous, however. We have among them the carboniferous and also the permian, many conspicuous examples to the contrary. Red shales and red clays, which contain their iron largely or wholly in the ferric condition, are not uncommon, geologically speaking.

The sulphide of iron is a "free lance," so to speak. It is common, both in old and young rocks. It is easily formed and as easily decomposed again. Oxidation, even at common temperatures, rapidly converts it into the sulphate, while similarly, the sulphate is easily reduced by decaying organic matter to the sulphide once more. Hence, its presence means either recent reduction, or that no opportunity for oxidation has recently occurred. It is called a ferric mineral, but in the conditions of its formation, it accompanies the ferrous group, and when it decomposes it invariably yields to the ferrous oxide first. So, while it is a ferric salt, it ranks with the carbonate in its tendencies in the clay.

But while the shales and fire-clays characteristically contain their iron in carbonate or sulphide form, it is also true that the exterior of most shale-clay and fire-clay beds have been more or less deeply oxidized by weathering processes. Whatever is easily accessible to air, percolating waters, and the mechanical action of heat and frost, is likely to become ferric, while rocks below drainage level, or covered deeply by other strata, are apt to remain ferrous

The effect of these various minerals on the color of the clays is not in itself strongly marked or characteristic. That is, as good a red color can be developed from a clay containing its iron as a ferrous carbonate as from ferric hydroxide. But the mineral form is of importance nevertheless from two causes. First, the tendency which some minerals show to crystallize or gather in concretionary masses. Second, the great differences in treatment which the different minerals require in burning.

As to the first tendency, it may be said that all forms of iron crystallize or gather in concretions. It is simply a question of degree. Ferric oxide and hydroxide are least prone to do so. In fact, where ferric concretions are found in clays, they generally represent reoxidized concretions of the carbonate, rather than accumulations originally ferric. Consequently a clay containing ferric oxide exclusively is apt to be of an even color on burning.

Ferrous carbonate, on the other hand, seems to exist in disseminated form or in concretions with equal ease. In fact, both forms generally exist side by side. A red-burning matrix will be full of black specks, produced by the lumps of the same mineral which produces the red color. Thus in dealing with a clay in which ferrous carbonate is known, there is every reason to expect that finer grinding and greater care in preparation will be necessary, unless the ware is one in which the presence of specks is not prejudicial.

Ferric sulphide, on the other hand, is invariably found in granular form. These granules may be large or small, but they are never small enough to give a red color. They invariably show up in the burned products as black specks or slagged spots, and hence in most wares are an unqualified nuisance. An interesting case of some kalonitic clays from the Philippines recently showed pyrites in every sized grain from 8 mesh down to 200 mesh, the latter requiring a glass to see the grains clearly. The pulp passing the 200-mesh seive burned gray, evidently from the little grains of pyrites which the seive had not been able to retain, as the clay itself burned pure white, in occasional places where no sulphide of iron was present.

The effect which these three different minerals exert on the color of the clay through differences in burning, will not be discussed at this time except to say that ferric hydroxide is the easiest to burn successfully, the carbonate next and the sulphide most difficult.

The Effect of Other Minerals on the Iron Color.

The considerations involved in the quantity, the distribution and the mineral form of the iron, have been shown to be accountable for much in the variety of color in the common or secondary clays. But, it has been shown that some of the fundamental phenomena are still unsatisfied by these causes. The development of the buff or yellow color is the chief of these. We have seen that we can not produce it synthetically with anything like the ease with which the red is produced. In fact, the writer has never succeeded in making a good buff from a white, by addition of iron. The use of iron in white clays has given a pink series, but no yellow. It seems that the latter is due to another factor, viz: the masking or suppression of the iron color by other elements in the clay.

Seger has classified buff-burning clays into two groups. First, those high in iron, which would burn red normally, but which contain so much lime as to destroy the red iron compound and form a yellow lime-iron compound in its place. Second, those clays low in iron, which would burn to a pale red at best, but which contain enough alumina to form an alumina-iron compound of a yellow color. Seger thinks the destruction of the iron-red color in these two cases is accomplished by similar means, and that lime differs from alumnia in being the stronger and more active base, and thus being able to overcome the greater quantity of iron.

All agree on the former proposition. The effect of lime on the iron-red color in clays is undeniable. The reaction is in daily use as a means of controlling iron colors, all over the world. But to this second proposition, the writer can not give unconditional assent. The evidence Seger marshalls is strong and undoubtedly points to his conclusion. But if it were true, then synthetic mixtures should easily give the buff color, which has not been the writer's experience. We certainly find an amazing uniformity in the color of buff-burning clays, while their iron-alumnia ratios fluctuate very greatly. Some fire-clays contain 40 per cent. of alumnia and 0.5 per cent. of iron, and burn a good buff. Others contain 15 or 20 per cent. of alumnia and 2.5 to 4 per cent. of iron and burn to almost exactly the same tint. Other clays of different geological history, containing about the same alumnia and iron, burn a fine red color.

It seems as if some other influence than either the amount of iron, its distribution, or its masking by other oxides must be brought in to explain the buff-burning fire-clays. The significant fact is that fire-clays occur so very generally in connection with coal veins or other accumulations of organic matter. Wherever carbon has been accumulated in bygone ages, there we find buff-burning clays immediately underneath. Often the coal has been washed away while still soft, and disseminated, but the fact that it had been, is proven by the fire-clay vein which is left behind. In fact, the fire-clay more uniformly marks the coal swamp, than the coal itself.

This connection, so constantly shown all over the world, in strata of all ages where coal has grown, certainly seems significant. Whether the swamp growth has formed certain organic salts of iron which influence the color, or whether it is by the removal of other substances than iron, or whether it is by stimulating the growth or concretionary forms of iron and thus preventing the distribution of the color, can not be stated.

On the other hand, in support of Seger's theory that alumnia masks the iron and produces the buff color, the fire-clay beds of New Jersey, the flint clays of Missouri, and many of the cretaceous fire-clays of Germany, may be cited. They do not occur in connection with coal veins, nor is it reasonable to suppose that they are composed by the erosion of other carboniferous fire-clay beds, and deposited without sensible blending or intermixture with red-burning sediments. In fact, their occurrence, alternating with beds of sand, gravel and red-clays, give the lie to any such assumption.

The most we can say at present on the cause of the buff color of the fire-clay groups, is that they generally contain less iron than is needed to produce a red color; that this iron is distributed in the most perfect manner possible. Seger's alumnia theory does not seem to wholly fit the case, and the geological history of fire-clays and their production by swamp-growth and carbon accumulation is after all not a cause. There must be a difference in compound, or amount, or distribution, or their geological history could hardly avail to produce a difference. The settlement of this most interesting point is one which invites the attention of the ceramic investigator.

The effect of the accompanying minerals on the color generated by iron is not confined, however, to the reaction known as "masking," which has just been discussed. There is another class which is a prolific cause of trouble in getting the usual iron colors, but which has no offsetting advantages in the way of producing desirable new colors. I refer to the presence of reducing agents, like carbon, hydro-carbons or organic matter, or sulphur compounds. These substances all burn out from a clay readily under favorable conditions. They do not, of themselves, add to or subtract from the colors wrought by iron. But, by virtue of their superior affinity for oxygen, they prevent or delay the iron from playing its customary role, and hence cause untold trouble in the burning.

The ancient or fossil clays are the ones most affected by these troubles. Recent clays, like the river and glacial beds usually contain some trifling amount of organic material, but it is still woody in nature and hence easily combustible. It burns out early in the process of firing, and leaves the ware spongy and easily accessible to the kiln gases. Hence, it does no harm except when it becomes excessive in amount and thus makes too much heat.

But shales and fire-clays have been generally altered by heat, pressure or bacterial action, and their organic matter has been turned into graphite, or coaly matter, or bituminous or asphaltic cements which penetrate the clays most intimately. Also sulphur, which is seldom found in quantity in the surface clays or the young clays, is nearly always common in the old or fossil clays.

The most difficult clays to burn which the clayworker ever meets are the bituminous and pyritiferous shales and fire-clays. It is safe to say that the losses incurred in clay burning center largely around the troubles which these minerals aggravate, if not actually cause.

The Treatment of Clays in Burning.

We have now seen that the occurrence of iron in clays is so varied as in itself to suggest a cause for the complexity of results which practice demonstrates. And there is no question that much of the richness and variety in clay products does come from just this fact. But, the treatment which the clays receive in burning is a matter of fully equal concern to the clayworker, because the strength, durability, beauty and color, texture, in fact the whole quality of his product, is affected or controlled thereby. It is a matter of even greater concern, because it is largely under the control of the clayworker himself and is thus a direct key to commercial success, while he can not exercise a similar control over the composition of the clay itself, except for fine wares, outside of the range of this discussion.

It is strange perhaps that iron should play a part of such exceeding prominence in clay burning, but such is the case. It not only has the power to color the products though a multitude of varying shades and tints, some beautiful, others unsightly, but it also has the power to cause the ware to swell up, to become deformed, to become pimply and rough on the surface, to become spongy and weak, in fact perfectly worthless. In order to guard against these troubles, it is necessary to understand their causes, and this involves an understanding of the whole theory of the burning and vitrification of claywares.

Clay burning is chemically a most complex process; it consists of a series of reactions overlapping one on the other in such a manner that one can never trace the exact beginning or end of any single one. In general, we may divide it up into three principal kinds of reactions, and these divide the burning process roughly into three corresponding stages.

First. The dissociation of materials which are unstable at high temperatures, and the expulsion of the volatile portions from the mass of the clay.

Second. The transformation of the non-volatile elements from less stable into more stable forms by absorption of gases from without the mass.

Third. The amalgamation at an elevated temperature of the various residual inorganic substances left by the two preceding reactions, into a more or less perfect silicate compound.

Of the reactions which make up these three classes, there are some which are necessary to the successful execution of the burn; others whose influence is seemingly not necessary or important; others which can not be construed other than injurious to the product, and to be avoided as far as the case permits.

The division of the burning into these three periods is of course arbitrary, since the reactions overlap, and at no time can it be said that one process only is going on. However, it affords some measure of convenience and intelligibility to a process which is otherwise complicated, and may be justified on that account.

The Dehydration Period.

The reactions of this period are only the preliminaries by which the minerals of the clay are brought into condition for the final combinations which culminate in the finished ware.

The reactions are chiefly:

(a) Expulsion of hygroscopic water from the clay.
(b) Combustion of carbonaceous matter.
(c) Distillation of S from pyrites, leaving FeS.
(d) Dehydration of kalonite, ferric hydroxide and other hydrous minerals.
(e) Decarbonization of carbonate minerals.

Taking each in turn we may describe them as follows:

Expulsion of Hygroscopic Water.

This is not a chemical process, but its power to interrupt or defeat chemical processes is so great that it seems proper to give it a place.

Water is vaporized at 100 degrees C., and theoretically cannot exist longer in the clay in the free condition after that temperature is reached. But practically, the pores of the clay ware retain it obstinately until temperatures considerably in excess of 100 degrees are reached in the general atmosphere of the kiln. The kiln is hardly to be considered dry until the atmosphere of its coldest part has reached 150 degrees C.

The power for ill which this process exerts lies in the delaying of other processes, by which the time devoted to their execution is shortened. No oxidation or dehydration can occur while the mechanical water is present, and further, no sensible headway can be made in heating the ware up until the water is gone. And since the heat required to evaporate water is 537 units, and since the specific heat of water below boiling is five times as great as that of clay, and since the specific heat of steam is twice as great as that of air, it is plainly to be seen that where two pieces of ware, one wet and one dry, are both subjected to the same kiln gases, that the dry one will attain a high temperature rapidly, while the other will gain no heat for a long time. Hence, when the temperature reaches the point where some other chemical reaction is due to begin, one piece is prepared and the other is not prepared for it.

The practical importance of this point is exceedingly great. The simple remedy is never to set ware in the kiln unless it is dry, or if for any reason ware must be set which the burner knows is too wet, or if some wet ware has been interspersed through the dry ware, then he must convert his kiln into a dryer, and fire it so slowly and so long before venturing to raise fires, that all original inequalities of water will be removed.

Many very intelligent burners and managers believe that the swelling or bloating of clay wares is due to the water escaping at high temperatures. In fact, the writer himself advocated this theory in 1892. But further study has shown that wet ware is only the indirect cause of the trouble. The actual swelling takes place by another chemical reaction. But if the water had been properly expelled first, the second reaction would not have happened.

The picture (Fig. 1) shows an example of this difficulty which is common in most paving-brick plants. Two brick, stuck fast to each other in burning, one swelled, and the other square and true. The swelled brick was set damp, while the square one was dry. Yet both must have had the same conditions of time, temperature and chemical composition of kiln gases.

Combustion of Carbonaceous Matter.

This reaction is one which may cover a very great heat range depending on the kind of carbonaceous matter present. There are several principal forms:

1st Vegetable tissues, fresh or but little altered, such as rootlets, grasses, leaves, bits of wood, or wood pulp, turf, or peat-like manner.

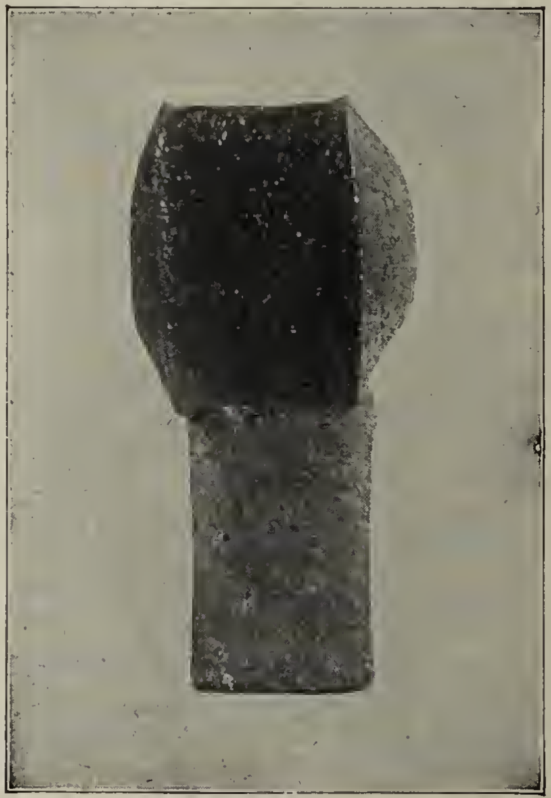


Fig. 1.

2d. Vegetable or animal matter, greatly altered by partial decay, or partial distillation under heat and pressure. Here belong the lignitic matters found often in ball clays, and the bituminous and asphaltic matters found in the shales of the carboniferous and earlier periods.

3d. Inorganic carbon minerals, in which any organic structure they may have had has been blotted out by the distillation and heat treatment they have undergone. In this class belong the graphite found in the shales and slates of the Appalachian mountain district.

Besides these substances which naturally occur, there are others, added for various technical ends, which fall more or less directly into these classes: for instance sawdust, tanbark, and straw in the first, and anthracite coal-dust and coke-dust in the third division.

The first class, or woody tissues, burn out rapidly and at low temperatures. Wood catches fire even as low as 250 or 300 degrees, and if the amount is small, this class of substance rarely does any harm. If it is large, as in the making of fire-proofing or terra cotta lumber, where sometimes as much as 40 per cent.

of sawdust is used, it is capable of ruining the ware, by bringing the heat up too fast.

The second class, or bituminous matter, is the most common and most dangerous form in which combustible matter may be found in clays. Its danger lies in the fact that it is a partly volatile substance, solid at ordinary temperatures, but which readily breaks up into a rich combustible gas, and a residue of carbon or coke, by the raising of the temperature. Three to six per cent. of such carbon is often found in a shale clay, and this means, in a kiln of 50,000 bricks, six to twelve tons of fuel, or a third enough to burn the kiln, if its heat could only be utilized.

The volatile portion of these bituminous matters naturally burns very rapidly and with intense heat, when the temperature reaches the point where it is expelled. In fact its combustion raises the temperature of the kiln so rapidly when it once catches fire, that it urges on the completion of the distillation far faster than the normal heat of the kiln would do, and does not cease until every bit of volatile matter has been expelled and combusted. But by this time, the temperature of the kiln will likely have passed all safe limits and the ware have become swelled, melted and stuck fast together.

Fig. 2 represents a collection of bricks from Lorain, O., where a black shale containing 6 per cent. of bituminous matter was being worked. Spalls of this shale thrown into a hot kiln would blaze nicely for several minutes. The company was making brick by the dry process. After spoiling many kilns, they were finally told to shut off the air supply, when the gases took fire, and let the conflagration within go on slowly until it finally burnt itself out. The leakage of air through the walls of the kiln and through the daubing of the fire holes and wickets was sufficient to combust more gas than was advantageous. Unrestricted air supply simply melted the bricks. Five days of this slow distillation was sufficient to drive out all but the solid coke residue. The kiln was then opened, air admitted, the last of the carbon burnt out and the work proceeded.

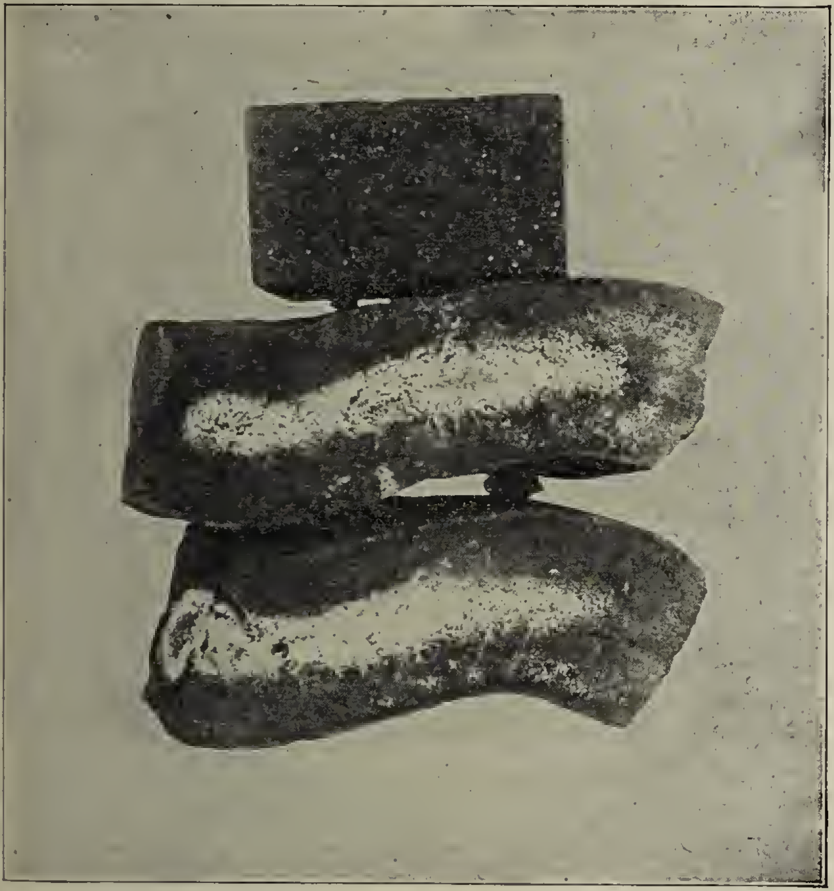


Fig. 2.

The brick on the top shows the brick properly burnt. Those below show the results of unrestricted air admission and consequent melting. The danger from this form of carbon is not wholly confined to the too rapid combustion of gases. The residue of the carbon left in the clay when the gas goes out, is still a troublesome problem. It is so fine, so evenly distributed, and so intimately blended with the clay, that it is much more difficult to burn out than ordinary graphite or coke or anthracite slack.

The cut (Fig. 3) shows a collection of draw-trials made from a moderately bituminous shale from Cannelton, Indiana. The shale had passed a 16-mesh screen and was worked by the plastic process. Beginning on the left, the first trial was drawn after 20 hours firing, 10 of which were above red heat. No. 2 was drawn at 24 hours. The color of the uncombusted carbon in the core was paler, but not reduced in area. No. 3 was drawn after 30 hours. The carbon had burned out somewhat, as was shown by the reduced size of the black spot. No. 4 was drawn at 37 hours, showing the carbon practically gone. The kiln was then fired till 44 hours, and No. 5 was drawn when cold. The central core is of a brighter, more orange-red color than the exterior. This shows first in No. 3, encircling the small black core. No. 4 shows it also, but No. 5 shows it most strongly developed. This difference in color is due to the fact that the iron oxide has been reduced by the carbon, and although reoxidized perfectly, it never takes the same color again. It is, in fact, the same reaction discussed by Bleininger under Notes on Flashing*

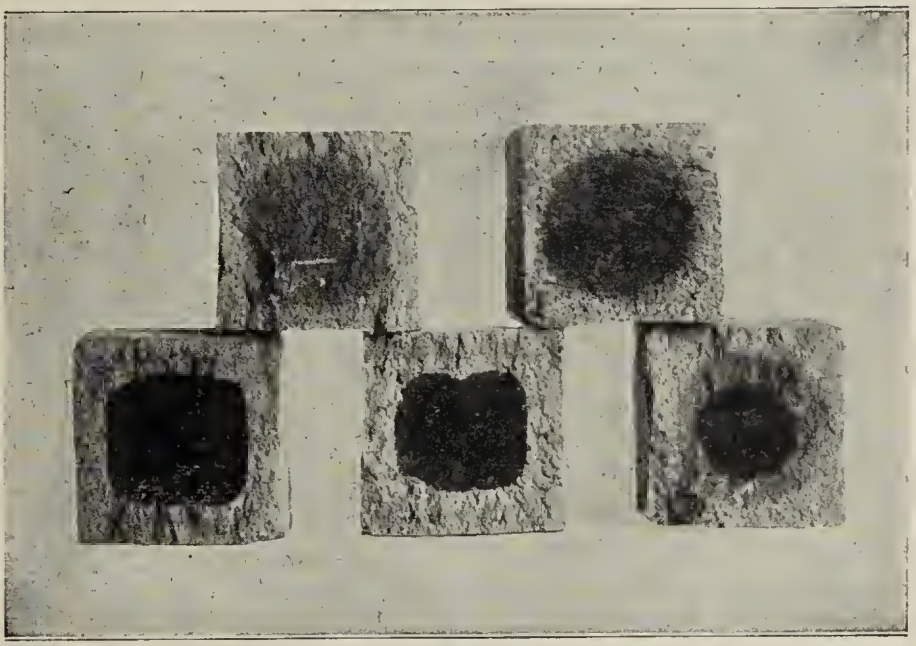


Fig. 3.

Considering the small size of these briquettes, and the special regluation of the test kiln atmosphere for oxdizing the carbon, the above series is a very instructive example of the slowness and difficulty with which this is accomplished. Where a whole kiln of such wares is to be treated at once, the difficulty and necessity for time are correspondingly increased.

The third class, or non-volatile carbon, is not often a source of danger or inconvenience to the ware, especially in relatively coarse or granular forms. It burns only by slow oxidation, or glowing, and without flame. It does not burn out until a good red heat is reached, and requires that time be given for this to take place. Otherwise, it is seldom a cause of trouble. In fact, it is often purposely added to a clay, to make a better distribution of heat in the kiln. The brickmakers of the Hudson River district are especially addicted to the custom.

As will be seen later on, the carbon compounds are not *in themselves* particularly troublesome or hurtful to a clay, for they always disappear in the burning if given any chance, and are not often in sufficiently large quantities to exercise any great effect on the working qualities of the clay while raw. But they are a most fruitful cause of trouble indirectly, by their influence on the iron compounds, as will be shown later.

Distillation of Ferric Sulphide. FeS_2 is a mineral which is perhaps responsible for as much of the trouble incident to clay burning as any other single one. Its heat reaction is peculiar in the fact that the sulphur is not driven out at one time, but in two stages. The first decomposition is represented by the formula

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*Transactions Am. Ceramic Society Vol. II p. 74.

$$FeS_2 + heat = FeS + S.$$

This reaction can easily be verified by heating a little pyrites in a glass tube, to the point of redness or just below. The first molecule of sulphur comes off, forming yellow oily drops on the side of the glass; the black residue remaining is found to contain one-half of the original sulphur.

The second molecule of sulphur is obstinately retained by the iron, and can only be removed by roasting with free oxygen in abundance. The point at which this is completed will depend on the porosity of the clay, the rapidity with which the heat advances, and the purity of the hot air which has access to the clay. If it is largely diluted with combustion gases, the oxidizing power is, of course, much cut down.

It is safe to say that in ordinary cases, the first molecule of sulphur from FeS_2 is expelled and burns to SO_2 or SO_3 at temperatures of 400 to 600 degrees C. It is equally safe to say that the last molecule is not expelled at all, unless due opportunity is given. Under favorable circumstances, it undoubtedly is roasted out by 900 degrees C., and perhaps earlier. Where this does not occur, the FeS fuses, forming a black slag.

Dehydration of the Hydrous Minerals. The chief of these is the kalonite, which loses its water at a low red heat, variously estimated at 550 degrees to 650 degrees C. It is now the opinion of the writer that the expulsion of combined water from clay, or from any other hydrous mineral, can not be the cause, in itself, of any of the troubles incident to clay burning. An opposite view was entertained and published in 1892*, in which the swelling and blackening of red and buff burning clays was ascribed to this cause. Langenbeck in a private communication, was the first to call attention to the impossibility of this explanation being true. There is no doubt that clays have, at the completion of the dehydration reaction, a structure more porous than at any time, before or after, and the swelling of clays is now explained in another way.

Besides kaolinite, water of combination is found in various other minerals, gypsum, talc, various zeolites, and the hydroxide of iron and manganese. Undoubtedly they all lose their water quietly and easily, as kaolinite does, and at as low a temperature.

The Decarbonization of the Carbonates. Of these minerals there are four commonly found in clays, and several may be found together in one clay. These are: Carbonate of calcium, carbonate of iron, carbonate of magnesia and dolomite.

The carbonate of lime, so common both in and out of the clay strata, is a constant factor in clayworking operations. Only two classes of clay are presumptively free from it, viz: fire-clay of the coal measures and alluvial clays of recent origin. Shales may or may not be free, and bog clays and glacial clays are pretty sure to contain it.

The heat reactions of calcium carbonate have been carefully studied by the lime and cement chemists, and from them we know more of its behavior than from the researches of clayworkers. It decarbonizes at 600 to 900 degrees C., the time depending on the composition of the kiln gases. The more steam is present, the more readily is the gas given off, though why that is so, is a matter of conjecture. The decarbonization is certainly delayed if CO_2 is present in large quantity in the gases, and CaO once formed will actually revert to $CaCO_3$, if the CO_2 gets too high a constituent in the surrounding gases, and the temperature is not too high. Above 900 degrees C., the reabsorption of CO_2 is not possible, until the temperature drops again.

Carbonate of iron, or siderite ($FeCO_3$) is a very abundant mineral in clays. As already indicated, it is found chiefly in the shale, and generally not in clays of recent deposition. The former greatly outweigh the latter in quantity, but the latter are more widely distributed and accessible as well as more plastic, and hence respond more readily to the clayworker's needs. It is natural, therefore, that the clayworkers should have avoided the former as they have done.

But in comparatively recent times, shale clays have sprung into great favor, chiefly for their undoubted fitness for making vitrified wares, like sewer pipe, paving brick and hard building brick. And in using them, clayworkers have come into frequent contact with a series of phenomena for which their older practice with superficial clays had not prepared them.

The behavior of $FeCO_3$ on heating has been made the subject of one incomplete series of tests in my laboratory. We found that at 425 degrees C., the CO_2 had been fully expelled. How much lower than this point the reaction began, we have not yet determined, as the first briquettes drawn at 425 showed the CO_2 already expelled. The test was made on a kidney iron ore which contained about 35 per cent. of iron as carbonate and 6 or 8 per cent. as ferric oxide. The ground ore was plastic enough to endure being molded into briquettes without the use of any clay as a binding agent.

These results were a surprise, as the idea had been accepted previously that $FeCO_3$ retained its CO_2 vigorously till 800 or 900 degrees.

The decomposition of magnesium carbonate and of dolomite takes place at about 400 degrees C., and 600 degrees C. The latter figure is not accurately known, but it is known to be between the point where the calcite and magnesite break down, and much closer to calcite than to magnesite.

The small quantities and infrequent occurrence of magnesite in common clays makes these figures of much less moment to us than is the case with the carbonates of lime or iron.

The decomposition of the carbonate minerals is a very important and significant thing in a study of the vitrification process in clays, on account of the reactions which begin between the basic oxides thus formed and the silicates of the clay. But their interest in this present connection is chiefly because of the carbonic acid gas which must be expelled before the oxidation of the iron can enjoy a free scope. The genuine obstacle which the carbonate clays offer to satisfactory oxidation, is apparent to all who deal with them. Limy clays especially resist it, because their pore system is clogged with the escaping CO_2 until so late; 900 degrees or thereabouts.

The heat behavior of ferrous carbonate differs from that of $CaCO_3$ or $MgCO_3$, in the fact that FeO, which remains when the CO_2 is set free, is not a stable compound. In fact, it is one of the most unstable; it is difficult for the chemist to produce and keep FeO, free from oxidation. Consequently, the breaking down of the $FeCO_3$ is only the signal for a second reaction, viz: the oxidation of the resultant ferrous oxide to the more stable ferric form. This reaction will be fully discussed in the succeeding section.

In the foregoing, has been set forth in some detail the general behavior of the minerals during the heating from atmospheric temperatures up to 700 degrees C. No single clay is likely to contain all of the various minerals here noted. But on the passage of any single clay to this temperature, it is believed that the order of the changes and their results would be about as described.

The Physical Structure of Dehydrated Clay. It is important for us to realize the physical condition of a clay after this stage has been reached. This can easily be observed by any one drawing a piece of clay ware from the kiln, when it has attained bare redness in daylight, and cooling it promptly.

The porosity is greater than at any other stage. The mass retains the structure given it during manufacture. That is, the pores occupied by the water while the ware was plastic, still remain. To this porosity is added that produced by the loss of combined water from the clay substance, the loss of CO_2 from some of the carbonates, the burning out of the organic matter, and the partial distillation of the FeS_2. The shrinkage has not begun. The clay measures just as it did when dry. The hardness is very low—scarcely greater than that of thoroughly dried clay. Also, the strength is very low—not being much increased by the burning process so far.

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*Ohio Geological Survey Report, Vol. VII, p. 81.

The color will ordinarily have changed from the natural clay color, to a very pale yellowish-red or salmon, in those clays which contain much iron. In fact, in fire-clays which ultimately burn buff, the color at this stage is apt to be pinkish-red, which fades and yellows as the heat rises. The same is true of calcareous clays, in which the iron color is masked by the lime. These clays are red early in the burn, becoming yellow only after the lime becomes fully caustic.

The Oxidation Period.

As set forth earlier in this paper, the fundamental work of this period is the transformation of the more volatile elements of the clay from the less stable to more stable forms by the absorption of gases from without the mass. This simply means that FeO or FeS must be converted into Fe_2O_3, before it is safe to proceed with the next step in the process.

The advisability of giving a separate subdivision of the whole process of clay burning to this small portion of it, may seem to some to be doubtful. Especially, when it is reflected that this stage is most important in red-burning clays, less so in buff ones, and not even noticeable in white burning bodies.

But it has been the experience of the writer, that the difficulties and losses in the burning of crude clay wares are more largely referable to mismanagement of this phase of the burning than to any other; perhaps more than to all the other causes combined. And, while there is no actual line of demarkation between the dehydration, decarbonization, and oxidation reactions, all of them overlapping more or less, still it seems essential to create in the mind of the clay burner the feeling that separate and clearly marked stages exist, and that he must satisfy himself of the completion of each before passing to the next. Lastly, while oxidation may take place at any point on the lower end of the temperature scale, it can not take place at all if the limits of this period are once passed. Thousands of dollars would be saved annually if clay burners could be brought to see that in passing above this temperature line, they are taking an irrevocable step, and that clay not well oxidized at that time is practically sure to be spoiled.

It has already been hinted that the oxidation of FeO to Fe_2O_3 is not only an easy chemical reaction to perform, but even a difficult one to prevent. But also, it has been hinted that it does not take place with facility in the burning of clays. It seems apparent, therefore, that when such an affinity as FeO and O exhibits is unsatisfied after hours of exposure to red heat in a kiln, surrounded by a constant flood of gases in which free oxygen exists, that there must be some very definite and clear-out influences which are operating against this reaction. Such is the case. There are five reasons which deserve mention in this connection.

Mechanical Action of the Clay itself. When we calcine ordinary copperas at a low red heat, we produce Venetian red, the brightest and most beautiful red which iron oxide is capable of forming. Moreover, the reaction is easy, quick and complete. But when we set free 5 or 6 per cent. of FeO in a clay, we must recollect that it is distributed throughout a mass of fine particles closely packed together, which form a very effectual mechanical bar to contact of outside air.

Furthermore, we must reflect that the air can only circulate through the mass of the clay through the infinitely fine capillary system established by the water of plasticity or the almost equally fine interstitial spaces left between the grains of a dry-pressed body. We have seen that the body becomes somewhat more porous after the dehydration changes are complete, but the total amount of such porosity is, after all, not great; usually 25 to 35 per cent. of the mass of the clay. Into this structure (spongy structure I had almost said, but spongy gives a wrong idea of the openness) the fire gases must penetrate to accomplish oxidation. And while they will do so in time, is it a cause for wonder that time is required? Remember, that the gas is not forced in, or sucked out, by any physical differences in pressure.

The piece of clay is merely lying in an atmosphere of flowing gases, and from this it must gradually absorb the oxygen which the interior particles crave, and must carry it through the labyrinth of pore-spaces to the little particles of the ferric oxide waiting to receive it.

Hindrance caused by the Evolution of Other Gases. As already pointed out, the $FeCO_3$ breaks up early, and its CO_2 should have been completely expelled from the clay considerably before dehydration sets in. But, it may happen that the temperature proceeds upward faster than the reaction can keep pace, and hence before the $FeCO_3$ of the interior is all decomposed, the other reactions of dehydration of the clay, and decarbonization of the other carbonates, are also taking place in the exterior of the mass. The CO_2 from $CoCO_3$ in particular is known to lag behind most other gases in the clay, and it is not wholly disengaged until the very time when the vitrification changes are apt to begin. This mineral therefore greatly complicates the oxidation of the iron salts on this account.

The outpouring of the steam and CO_2 from these minerals now fills the pores system of the clay. The pressure is within, struggling to get out. Hence, there is added to the mechanical difficulty of air penetrating the clay, the distinct current of other gases coming out under pressure. Naturally, therefore, oxidation is hindered until these reactions are complete.

Influence of Combustion Gases. It has been shown that FeO is prone to oxidize, even at ordinary atmospheric temperatures, when freely exposed to the air. But in the kiln, the atmosphere is no longer pure air. It is composed primarily of combustion products. The reaction of oxidation takes place, we may assume, between 400 and 900 degrees C. It is most likely to occur between 700 and 900 degrees C., because of the influences pointed out above. Supposing that no heat is being withdrawn for pyro-chemical processes in the wares, and that only the losses due to the escaping gases and the radiation of the kiln itself are to be accounted for, it is plain that to maintain a strong flow of gases through the kiln at a temperature of from 700 to 900 degrees C. would require the steady consumption of a large quantity of fuel. Few people realize that the most rapid fuel consumption in the whole burn at just this period, and not at the end of the process, when the temperature is highest.

But if fuel must be burnt, then the air passing through must be laden with its products of consumption. If a fuel is burnt perfectly, and without excess of air, its combustion products would be CO_2, H_2O, and N. If the air be in excess, O and more N are added to the mixture. If the combustion be imperfect, as it nearly always is, then the gases may contain in addition CO, CH_4, C_2H_4, CS_2, SO_2, NH_3, and H. These latter gases are all reducing in effect, and hence their effect on the process under discussion is strongly deterrent. It is remarkable that reducing gases and free oxygen may thus coexist, but analyses have repeatedly shown that such is the case.

The active value of the kiln gases for oxidizing purposes depends, therefore, on several factors. 1st. The percentage of oxygen in the gases; 2d the freedom from counteracting reducing gases; 3d the temperature. This field has not yet been fully studied, but the researches of T. Lowthian Bell in iron smelting have shown that Fe_2O_3 can not be successfully reduced by furnace gas composed of CO, CO_2, and N, unless the ratio of the carbonic oxide to the carbonic acid has a certain value. The converse should be true in our case, viz: that FeO cannot be oxidized unless the ratio of the oxygen to the sum of the CO CO_2 and N has a certain value.

The lesson to be gained is, that mere exposure of clayware to the hot gases of a kiln, between 700 and 900 degrees, while it must in time have an oxidizing effect, is by no means certain to rapidly perform the needed operation. It depends on how these gases are managed. If the fireman is acquainted with the objects of his work, he can so regulate his fires and his draft as to give his gases the utmost oxidizing value possible without loss of temperature. If he has no conception of these theoretical ends in view, he will probably make his fires work so that their gases are well nigh useless for oxidation purposes.

During the dehydration period, at least during the bulk of it, oxygen is plenty. Calculation shows that the waste gases of the fuel must be diluted eight or ten volumes to reduce their dew point to a safe level during the drying off of a kiln. As the temperature rises, this enormous air excess decreases, but still may be three or four times what is needed for burning the fuel. But as soon as the ware is red hot through and through, the usual maxim of burners is to "push the fire as fast as the kiln will take it." They close the doors, or fill up the necks of the fire holes, and restrict the air supply, just at the very time when it is most needed.

Of course, it is evident that the air excess must be reduced, to permit the temperature to increase; but oxidation temperatures (700 to 900 degrees) can be maintained with a very considerable air excess if this point is duly understood by the burner, and made the subject of his skill and care.

In bad cases, when clays do not oxidize under ordinary treatment, a special procedure may be necessary to get round this difficulty. The Fish Brick Company, at Columbus, Ohio, use a bituminous pyritiferous shale, making a rather coarse-grained brick by the dry-press process, which they burn in the continuous kiln. They never have the least trouble from defective oxidation under these circumstances. But they made a few kilns by the plastic process, burning them in periodic kilns. They found, after considerable loss, that the following procedure was necessary.

The kiln was raised as usual up to about 900 degrees C,; the fires were then allowed to gradually die down to beds of ashes. The draft was reduced to a low point, and the kiln allowed to stand until the temperature had gradually fallen to 600 degrees C., or nearly black. This took 12 to 18 hours. Then firing up again, the kiln was carried up steadily to a finish. The secret of success in this case was the *long exposure to air nearly free from carbonic acid.* Eighteen hours of nearly pure hot air was effective, where three or four days of ordinary oxidizing at red heat had failed entirely to get the FeO all converted. Burners generally have a superstition to the effect that it is fatal to ware to allow the heat to drop back after once raising it to redness. There are good reasons in some cases, why this should be avoided. But in dealing with such a case as this, it is practically the only way to get good results.

Deterrent Effect of Solid Reducing Agents in the Clay.

As has already been shown, clays very commonly contain organic and combustible matter. It is even added largely in many clayworking processes. Further, FeS is one of the common sources of iron in clays. These substances are all eager for oxygen and are stronger in their affinities than FeO is. Consequently, it is clear that no oxidation of the latter can possibly occur, while the former remain unoxidized.

Carbon is a constant source of trouble from this cause. Where sawdust or coaldust is plentifully added to a clay, even a well oxidized surface clay, it is quite often the case that reduction of the iron follows, and the clay shows black in the center after firing, just as if it had been a ferrous clay to start with. Still more, when a clay contains its carbon intimately disseminated through it, it is likely to prevent the oxidation of the ferrous oxide. The long and painstaking oxidation required to completely rid some clays of their carbon has already been illustrated in Fig. 3.

Sulphur is a still more troublesome substance, from the fact of its combination with iron, and consequent slowness to yield to roasting. FeS remains in black slag-like masses after the first molecule of S is expelled, and can only be destroyed by persistent and strong oxidation. Meanwhile, the iron can not be effected, until the sulphur has been driven out.

The Effect of Structure of the Ware.

In the four preceding headings have been named the influences which are at work in the oxidation period of the burn. It is by no means to be supposed that in every clay, all of these influences are operating. In the typical brick and tile clays in use, no trouble is usually encountered, for the iron is already in the form of ferric hydroxide when it enters the kiln. Further, the clay is ordinarily sandy and open grained, and contains no sulphur and but little carbon.

Where the clay is an ordinary ferrous carbonate shale, the process is much more critical, but is easily mastered. The hindrance to oxidation requires longer heating before vitrification, and also opener firing while raising heat. But the burner soon learns this trick, and no trouble need occur afterwards. The oxidation is here much affected by the structure of the ware. Shales ordinarily are not so very plastic. Therefore, when tempered up with water, they develop an open porous structure, favorable to oxidation.

The finer grained the clay, the more difficult does oxidation become. The writer has occasionally tested very fat, immensely fine grained clays, which do not show any grit between the teeth. Such clays will fail to oxidize and will bloat in firing, where other clays with three times as much ferrous iron will behave normally.

The fineness of grain therefore, becomes a factor of the greatest importance and leads to practical steps to counteract its influence. Stoneware makers and sewer pipe makers have begun to find out that where they wish to make an unusually heavy piece of ware, that it is essential to open up the body of their clay by use of grog. The grog is prejudicial from one standpoint, but its aid in getting oxygen into the center of the thick ware in the same period of time as needed to reach the center of the ungrogged ware in thinner cross sections, more than overbalances the detriment.

Also, brickmakers have occasionally observed that an end-cut structure greatly hinders the oxidation. In one kiln made by the writer, containing about equal proportions of side-cuts and end-cuts from the same clay, the end-cuts were nearly all defective in the center and none of the side-cuts were affected. The difference comes from the direction of the laminations, which make the center of one brick protected by sheath after sheath of clay, like a jelly roll, while the center of the side-cut is made accessible by the lamination leading into it.

Also the dry-press process and the plastic process offer some curious comparisons. In general, the latter structure is much denser and harder to oxydize. But occasionally a clay is encountered which is very soft and fine grained and which packs in the dry-press die into a body of surpassing density. Such a body is exceedingly hard to oxidize, and can be worked much more safely in the plastic form. But if in addition to having its iron in ferrous form, a clay contains carbonate of lime or magnesia, or pyrites, or carbon compounds, then trouble must be anticipated. The more of these materials the worse, and when all three are present together, the difficulties rise to the point of prohibiting economical manufacture.

Probably no clay exists, which *cannot* be burned safely. If it comes down to a struggle between a well-equipped clayworker and the natural perversities and disabilities of a clay, the clayworker can succeed, every time. But when the cost has to be considered, the difference between a low fuel bill and a high one; between a quick circuit of kilns and a slow one; between a small percentage of loss and a high one; it is easy to see that some clays are better left alone. The writer knows of one instance where eighteen days were regularly required to burn a small round down-draft kiln of brick, where an ordinary coal-measure shale would have burned in seven.

The trouble was carbon and sulphur and difficulty in securing oxidation.

Physical Structure of Clay at the End of the Oxidation Period.

The physical condition of the ware at the conclusion of the oxidation period is worth attention. If the work has been correctly done, the ware will be uniform in color in its whole cross-section. Its color will be redder than at dehydration, if a red burning clay is used, or yellower if a buff clay is used. Its hardness will have sensibly increased, but it will still be soft. Shrinkage will have begun, but will have made but little headway. Strength will still be small.

On the other hand, if the clay be improperly oxidized, it will show on its fracture a spot, furthest from the exterior, of different color from the exterior of the ware. This new color is dark. The size of the spot will depend on the completeness or incompleteness of the work. The larger it is, the more certain it is to ruin the ware subsequently. Fig. 3 very nicely shows this feature. The location of the spot will depend on the shape or position of the ware in the kiln.

In Fig. 4, the first piece on the left shows a briquette with only a narrow border oxidized. The whole interior is untouched. But the oxidation has penetrated about equally from all four sides. The second briquette shows the same process further along. The third briquette shows an unoxidized spot close to the left side. In this case, the briquette lay close to another, and the air got between the two with difficulty. In consequence, the protected side lagged behind the rest of the briquette.

It often happens that when bricks are faced or piled up closely on each other, that the exterior of the pile will oxidize, and the interior will not. This causes the brick to assume a fantastic appearance afterwards, one part being good and another bad, without reason appearing from observation of the brick, apart from its setting.

In all that has been said so far, the allusions to trouble ensuing from incomplete oxidation have been frequent, but little has been said in explanation of what these troubles are. The reason for this reticence is that the real development of the trouble occurs only in the vitrification process. If the burn ended at 1000 degrees C., then all of this discussion would be valueless. But hidden away in this apparently unimportant dark-colored spot are half the potential sources of trouble to which clays are heir; only when the vitrification of the ware is nearly finished, does this malevolent disease break out and show its capacity for damage.

The Vitrification Period.

The period beginning about 900 B. C., represents the first constructive work in the burning process. All that has gone before is destructive of the original minerals which composed the clay, but not directly constructive of the homogeneous silicate, toward which the finished material is supposed to approximate.

To set forth the processes of vitrification in full detail, even if they were known, would be a task entirely beyond the scope of this present article. As a matter of fact, they are only dimly understood. The work of the cement chemists, the slag studies of the metallurgists, the work of the lithological analysis by the mineralogists, all have given us something in this field, but a persevering study of the subject from the view point of the ceramist has yet to be made.

To understand the behavior of the iron in the processes which follow, we must have a little preliminary idea of the process itself. In brief, it is a continually changing series of combinations, in which more and more of the ingredients of the clay are drawn in.

The first change is thought to be a sort of condensation or shrinkage in itself of the kaolinite base of the clay. This precedes silicate formation, at least for the most part. Then the caustic basic oxides, lime and magnesia, begin to react on the dehydrated clay, forming silicates and aluminates. These soon give way to other compounds which bring the finest of the free quartz into combination. The feldspathic fluxes also begin to work, and thus from one combination to another, the work proceeds, building up one compound only to form another from it as the temperature increases and the materials present become more fully available.

If we stop the process at a number of different stages, take samples, and examine them critically, the physical structure is a warrant for the above outline. When cross-sectioned and viewed under the microscope, the general truth of the above is proven, for crystals of entirely different minerals can be identified in the same clay at different stages of its combination, and even in different parts of the same mass, where the heat has been uneven. These investigations have so far gone but a little way and the minerals formed in vitrifying clays have not yet been identified or described. We are far behind the cement chemists in this, for they have identified several minerals in portland cement clinker, which is a much more difficult material to work with than ours, on account of its unstability.

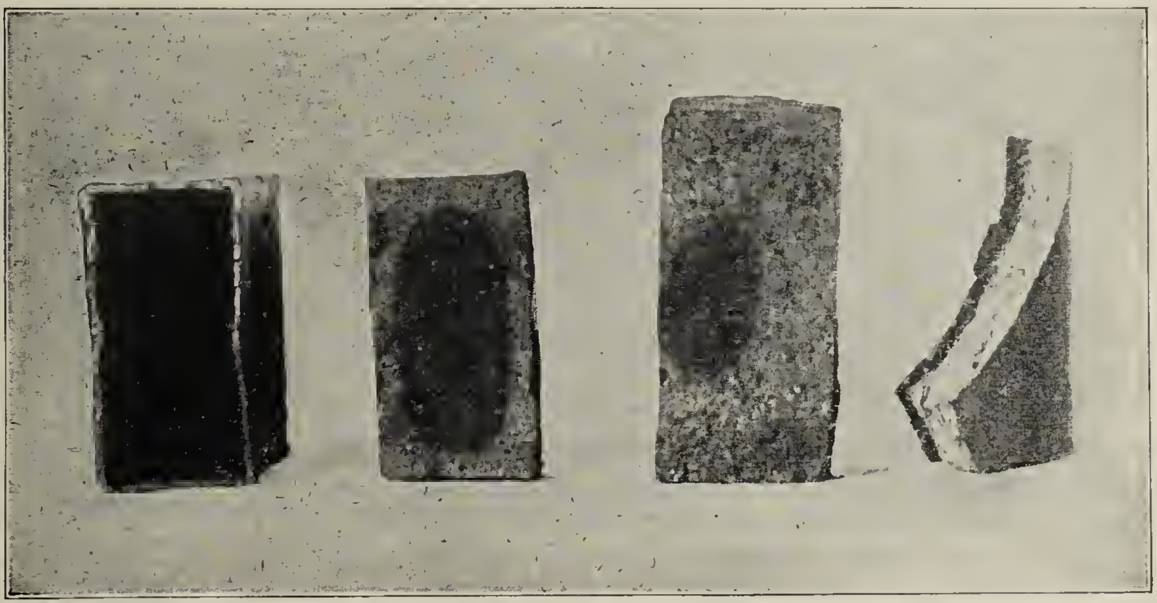

Fig. 4.

The behavior of iron in the above process is the theme to which we must confine ourselves.

Phenomena Occurring at or before Complete Vitrification.

Vitrification among clayworkers is a technical term. It does not mean, as many seem to think, that the clay has become converted into an absolutely homogeneous or glass-like solid, from which every vestige of the original mineral structure is obliterated. Such a condition is impossible in practical clay working. Even fusion does not accomplish so great a homogeneity, for when a clay is fused to a slag, its coarser particles have usually resisted solution and are still to be seen in the fluid magma.

To the practical clayworker, especially he who manufactures paving brick, sewer pipe, roofing tile, encaustic floor tile, stoneware pottery or porcelain, complete vitrification means that stage of a clays burn where it becomes densest and strongest.

All clays pass in burning through a series of stages, and and are progressively harder, stronger and denser up to a maximum; after that they begin to fall off, sometimes rapidly, sometimes slowly, until they finally become a worthless, vesicular, slag-like mass, devoid of useful qualities. The culminating point of excellence, though hard to define, is not hard to recognize. And while it does not by any means stand for the same qualities in any two clays, it is clearly defined to the practical man in dealing with each clay by itself.

For convenience, Wheeler* has divided the vitrification period into five stages, which mark well known differences in structure, though of course each stage passes insensibly to the next, without any dividing line. The four last stages he has named Incipient Vitrification, Complete Vitrification, Viscous Vitrification and Fusion. He gave no name to the first stage, but the writer has called it the Condensation Period, as indicating that the chemical changes occurring there are largely the simple condensation or shrinkage of the kalonite, and perhaps other minerals, without involving actual silicate formation. Wheeler describes this stage as that of the ordinary well-burned red building-brick, which can be cut freely with a knife, and yet has shrunk considerably since dehydration.

The point of complete vitrification makes an excellent place to divide our discussion, for the reason that no one voluntarily passes it in producing clay wares. And, those changes which mature before or by that time are all familiar ones, which must be reckoned with daily. The changes which follow are destructive changes, to be avoided if possible.

The separate iron phenomena which occur before or by complete vitrification may be listed as follows:

1st. Development of the normal ferric color, red or buff.
2d. Development of the normal ferrous color, by reduction.
3d. Development of the abnormal black core, by faulty oxidation.
4th. Blue-stoning, or the normal change from ferric to ferrous by increase of temperature under oxidizing conditions.
5th. Reoxidation or flashing.

Development of the Normal Ferric Color. A red-burning clay which has been properly treated in the burn up to 900 degrees C., has acquired by that time a yellowish-red, or pale-red color, which is called salmon. As the temperature continues to rise this color deepens and brightens, until by 1100 degrees C. in most clays it attains its maximum brilliance and power. This red color is said to be that of free ferric oxide which covers the grains of the other minerals with a film and creates almost as much color and as bright a tint as if the mass were ferric oxide throughout. Seger explains the successive shades of red by the increasing density of the iron oxide as the temperature rises. Condensation involves darkening of color, he argues, and cites experiments conducted on pure ferric oxide to prove the point.

The evidence that proves this to be the free ferric oxide and not a ferric silicate, or aluminate, is more negative than positive however. It can be proven that the iron is in the ferric condition, readily enough. But to prove that it is not in combination, is not so easy. Solution of the iron is no longer possible to any agents except such as attack the rest of the clay as well. We judge by the color, which is ferric, and by the abrupt change in color which happens later on when silicate formation unquestionably does take place, that this red is that of free oxide.

The question now arises, why is it that ferric oxide can remain so long out of combination, when surrounded by clay, silica, and other fluxing minerals, which are one by one breaking down and entering into bonds with another? The question must remain unanswered. But experience proves that whatever the red color is, it remains intact for a long time as the heat rises, suffering no change except a gradual brightening and deepening in tint, up to a certain maximum. This maximum is not a fixed point for all clays. It varies with the composition of each. Those clays which keep it the longest are those containing least clay substance and most pure sand. A very sandy clay from Wisconsin was fired by the writer to cone 8 in a not very oxidizing burn, and remained a fine strong red, bordering on purple at this temperature. An ordinary red clay, containing 50 per cent. clay substance cannot be fired above cone 1 without beginning to show a decline. Soft fluxes like lead or alkalies, which promote silicate formation, tend to bring the iron into combination also, and destroy the red color of ferric oxide.

As a rule the retention of the red color in its perfection and the development of a close, dense, glass-like vitrification seem to be mutually antipathetic conditions. That is, in most red-burning clays, their behavior seems clearly to bear out the contention that the color is due to *free* iron. For, as fast as the vitrification becomes visibly more perfect, the color darkens and the body seems to approach to its point of breaking down.

But occasionally, or rarely, a clay is met which contradicts this impression. Such clays have in the writer's experience attained a vitrification almost like glass, preserving the while a red as bright and beautiful as sealing wax. Ink placed on the fracture will dry and scale off without leaving a mark.

It is truly hard to see how iron can be wholly free and unattached in a silicate mass of such perfection. But, when such a clay is heated past this culminating point, it follows the general law, and blackens as it breaks down, thus seeming to show that combination of the iron means loss of its ferric character.

In one instance only, in an experience covering a large number of clays, has the writer found one which maintains a red color after passing into the vesicular stage of fusion. This clay is remarkable for immense fineness of grain, vitrification at extraordinarily low temperatures, and very early swelling into a spongy mass. It is possible that the exception is apparent rather than real, and that the clay really did blacken in fusing, but that owing to its spongy structure, and the low temeprature and consequent excess of oxygen in the kiln gases, that *it reoxidized after blackening.* A supply of the clay has been secured for further tests.

A resume of the evidence, then, seems to indicate that clays are colored red by free ferric oxide, and that combination of iron with clay or silica involves blackening and formation of the *ferrous* silicate. The ferrous state of the iron in a black overburned clay is easily proven by analysis. If this theory is not true, then the red color must be due to an unstable ferric silicate, which forms a stable black ferrous silicate after a certain critical temperature is reached. Most clays seem to favor the former hypothesis. A very few favor the latter. It must be borne in mind, however, that these latter clays all vitrify very early, and before the ordinary range of temperatures are reached. No instance of a clay has yet come to the writer's attention which burns to a vitreous red at a high temperature.

The behavior of buff-burning clays runs parallel to the above described phenomena, except that there is much less difference between the soft and fully matured ware than between salmon and good red. The latter change is almost a change in kind, while the former is one of degree. Also, during the retention of the buff color, complete or glassy vitrification is not quite so uncommon as the sealing-wax red. But, aside from the fundamental difference in the color, the two series pass through about the same course of events, and bear out the same conclusions.

Development of Normal Ferrous Color, by Reduction. One of the strong arguments for a free ferric oxide as the basis of the red or buff color, is the prompt destruction of that color by anything like reduction. Reducing gases, smoky fire, dirty grates or restricted air supply, very soon produce a greenish or bluish black coloration in a red or buff ware. This blue-black material is readily proved to be ferrous by analytical means. To prove that it is a silicate is not so easy. But, proceeding on synthetic lines, we can make ferrous silicates by fusion, and they all have a black color, comparable directly with that obtained in the reduced clay. When we attempt to produce a ferric silicate of a red color, if exclude the solution of Fe_2O_3 in a gloss or glaze, we fail.

The rapidity of the change from red to black depends upon (a) the violence of the reducing condition and (b) the porosity of the ware, by which the gas reaches the ferric oxide or ferric compound. Open spongy structures are affected almost at once. Dense vitrified structures suffer gradual change; sometimes several hours of continuous reduction will still fail to penetrate the center of a mass.

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* Vitrified Paving Brick, by H. A. Wheeler, Pub. Indianapolis, 1896.

This reaction is exceedingly common among producers of vitrified wares. If the reduction occurred late in the burn, during the flashing or salt glazing process, it very frequently shows as a blue-black ring, extending in an eighth or a quarter of an inch from the surface, and surrounding a bright red core. Sewer pipes especially are prone to exhibit this phase, owing to the sharp pushing of the fires during the salt glazing, which is itself a reducing reaction.

Figure 5 shows several samples of this change. The piece on the left is a sidewalk paver, which has been reduced from a yellowish buff to a blue-black, on one side and edge especially. The other surfaces were somewhat protected. The next piece is from a buff sewer pipe. The interior surface shows the heaviest reduction, and the exterior surface shows a lighter, but distinct black ring. The next two pieces are parts of a hollow building block, made from a clay which burns a pale red. The blue-black color has proceeded half way through the piece. The piece on the right is a paving brick, of which only about one-third still retains its bright red color. The blackening has gone in nearly an inch from every surface.

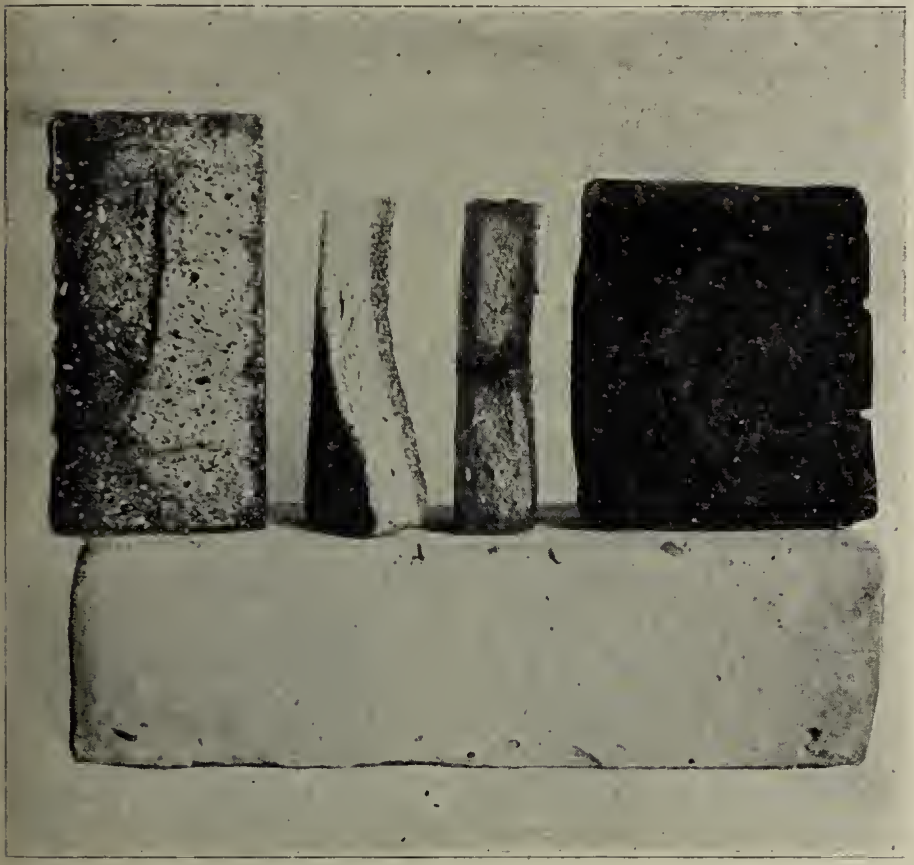


Fig. 5.

The permanence of such a reaction depends on the degree of vitrification attained. If the ware be porous, the reduction is ephemeral, being replaced by oxidation with equal ease. In short, while porous, the colors may be made to fluctuate with each firing, if the burner wishes. But, as the ware gains in vitrification and becomes impervious to gas flow, the colors become slower to create and slower to replace.

The effects of this reaction on the strength and value of the ware are not good. The black ferrous silicate does not seem to be as strong or durable a body as the red ferric compound. Paving brick which are thus blue-skinned, or smoked, usually wear badly for a time at least, the black crust breaking off in brittle spalls, showing the red beneath like an open wound. When shale pavers first began to be used, city engineers frequently went far beyond their province in specifying the exact color which they would require a brick to be, and many brickmakers learned to put a blue exterior in a red brick to meet just this kind of demand. The results were bad and the practice has now been generally discontinued. Enough of such brick are produced by accident, without having recourse to intention.

In wares like sewer pipe, however, which have no wear to endure, this change in color and loss of strength are much less prejudicial. But, if the black color be produced, another form of the same reaction is very likely to also take place, which *is* very prejudicial indeed. I refer to the formation of bubbles, pimples, eruptions, etc., on the surface of the wares.

Sewer pipe and conduit makers have no more troublesome defects to overcome than this bubbling. Paving brick makers suffer less, but face brick makers, especially those making flashed bricks, are very subject to it. No one likes to see an otherwise smooth clay product covered with little pimples or ragged-edged blisters of black slag.

The cause of this slag is the same as that of the blue-black coloration. It comes, however, from the occurrence of the iron in the form of concretionary grains. These masses of iron, while they remain ferric, will not readily combine with the clay. The writer has seen a case where grains of iron were still unfused in a buff face-brick burned at cone 8. The firing was done with natural gas, and the kiln atmosphere was perfectly oxidizing throughout the burn. The clay had blue stoned but the iron had not slagged in the least.

But let the atmosphere become reducing and these grains rapidly change to ferrous oxide. This oxide readily unites with silica or clay substance, and the result is speedily a little pool of a basic iron silicate. It is too basic to be very fluid, or to let gases escape from it or through it, so it becomes inflated and forms a little bubble. If the heat continues to rise, these in time melt, become fully fluid and finally lie flat and smooth on the surface as black velvety spots. But, if the bubble be formed at the maximum temperature of the kiln, then on cooling the wares are covered with these unsightly eruptions.

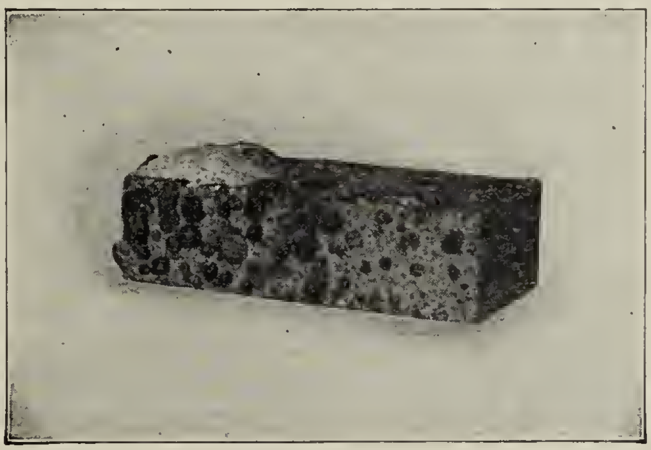


Fig. 6.

Fig. 6 shows a very bad case of this reaction on a flashed brick. The iron was excessive in amount, excessively large in grain, and the cooling happened at just the right time to show this reaction at its very worst. It is on that account instructive.

The remedy for this condition is to avoid reduction at the end of the burn. If the fires are kept clear, the grates kept clean, a certain amount of air admitted over the top of the fire, and no heavy black smoke created in firing, this pimpling on the surface, where due to iron, will not occur. With some fuels it is very difficult to avoid reduction; the choice of a proper fire place and the training of the burners to fire frequently and but little at a time, is the remedy in such cases.

Development of the Abnormal Black Color, by Faulty Oxidation. This reaction is not to be construed as different from the preceding in so far as the actual chemical process, or the character of the black silicate itself is concerned. The reason for its description under a separate heading is merely to emphasize the causes leading up to its development, and to aid clayworkers in recognizing the phenomenon when they see it. It has already been stated that failure to bring the clay to perfect oxidation at the lower range of temperatures, 600 to 1000 degrees C., before vitrification sets in, is one of the most destructive errors commonly made in the burning of ceramic products. It is so troublesome, because it is so insidious. No external evidence of the trouble is shown till too late. The process of burning goes along without a hitch, until the finish is close at hand, and then it suddenly shows. But then, it is long past help.

There are two reasons why a clay ware which is not oxidized at the proper time is never oxidized: First, the porosity of the ware rapidly diminishes as the temperature rises. Some clays mature wonderfully quickly in the temperature range between 1000 degrees and 1100 degrees. The majority of red-burning and glacial and alluvial clays mature in this short range. Others, the shales and the sandier common clays, require another 100 degrees to bring them to maturity, and, consequently, still continue to oxidize with fair ease long after the close-bodied, easily-vitrified clays are past the limit.

Second. The composition of the fire gases become less and less fit to oxidize the ferrous oxide as the temperature increases. It has been already pointed out that free oxygen *in large excess* is necessary to rapid oxidation. But as the temperature of the kiln increases, the products of combustion will stand less and less dilution with free air without becoming too cool. As the temperature reaches 1200 degrees, it becomes practically impossible to admit any excess of air, or rather, the combustion fluctuates between oxidizing and reducing with each baiting of coal, so that the average gas produced is neutral. Where temperature of cone 8 or above is used, the reducing reaction predominates.

Where for any special ware it is essential to maintain oxidizing conditions to a high temperature, 1300 degrees or above, it is necessary either to so construct the firebox and bags as to obtain a regenerative effect on the air supply, and thus decrease its cooling effect, or to use gas fuel or some similar device. With cold air and solid fuel it is very difficult, if not impossible, to prevent occasional reduction at even 1200 degrees C.

On these two accounts there is but little probability of the clay oxidizing after 1000 degrees C. is reached. In fact, but little of account happens after 900 degrees C. Hence, for all practical purposes, we may say that when ware is not oxidized at the right time, it will not be oxidized at all.

Having now established the primary cause of the defect, let us consider its mode of operation. The central fact in this connection is that ferrous oxide combines with silica and clay at temperatures far lower than ferric oxide does. Without at this time discussing the final breaking down of a red-burning clay by excess of heat, we know that if fully oxidized and red throughout, it will stand a temperature far above that at which the black ferrous structure forms and becomes semi-fluid. It is this difference in melting point which causes all the trouble. If it did not exist, then the condition of the iron would be immaterial.

Nor is the mere fact of fusion in itself so very disastrous. The final and most troublesome fact in the whole series is the evolution of gases by the ferrous slag. It is a matter of common observation, that silicates nearly always undergo a scoriaceous stage in fusion. In glass melting this is well marked, and in order to avoid its effects the temperature of the glass is run up till it becomes very fluid indeed. After a proper exposure of this temperature, the gas evolution gradually ceases and the glass settles back into a clear, dense fluid.

The same general facts may be observed in slag fusions, or in any other silicate fusion. Clay silicates are no exception. When they melt, there is every likelihood of a considerable evolution of gases, and these swell the ware up into spongy, slag-like masses, sometimes actually so light as to float on water. The only difference between clay and the silicates is that in the latter we aim to produce fusion, and push it far enough to get rid of the gases, but in clay we never aim to produce fusion, and consequently only carry our heating up to the very edge of this stage. Hence we encounter the very beginning of the gas evolution. In a few cases, the writer has seen clays fused completely into solid glasses, free from gas bubbles, but it is rarely that the overheating is sufficient to produce this state.

The gases which are evolved are not definitely known. There are but few which can be counted as possibilities. 1st, CO_2, from carbonates, especially carbonate of calcium, or from the gradual oxidation of carbon still inclosed in the mass. 2d, SO_2 or SO_3, from the breaking down of sulphites or sulphates, or the gradual oxidation of the sulphide of iron still enclosed in the mass. 3d, H_2O, if any could still be present as part of a hydrous compound or a hydrocarbon not thoroughly coked. The latter seems improbable.

The amount of gas evolution is a variable factor. It depends on the following conditions: 1st, the amount of material in the original clay which is capable of producing gas, *i. e.*, the amount of carbon, carbonates and sulphides; 2d, the completeness with which these substances have been burned out from the clay while it was still porous; 3d, the amount of overheating after the gases begin to come off. The worst clays to deal with are those which contain carbon, carbonates, sulphides and iron, all together. Such a composition is a fatal handicap to profitable manufacture. But it must be remembered that the actual volume of the gases set free may be a very trifling amount, and still be capable of working a great injury to the ware. The gases, as soon as they are set free, expand with each increase in temperature and become worse in their effects thereby.

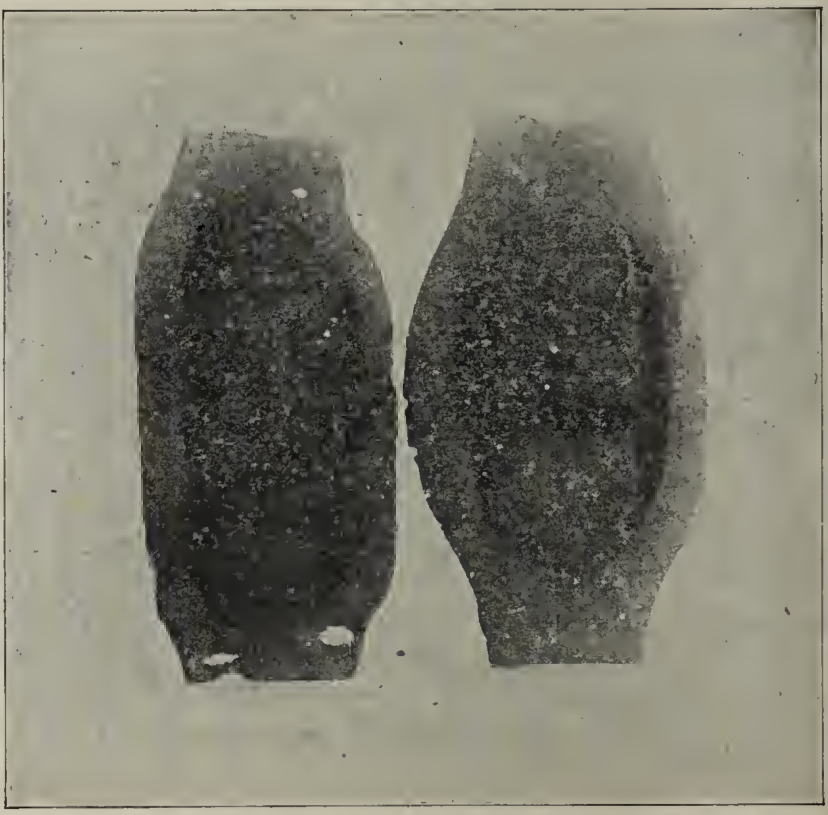


Fig. 7.

The time of the gas evolution depends somewhat on the clay itself. Beyond a doubt, every silicate has its own formation temperature, and before this is reached, it is innocuous. These clay silicates have not yet been studied so carefully as to enable us to say anything on this head. But, the silicate formed will depend on the composition of the clay, and it is quite likely that several silicates form and dissolve one in the other, producing slag whose melting point as a whole is referable to no single silicate. Thus a clay of fine grain and high in fluxes may blacken and swell very much earlier than another of coarse grain and low in fluxes. But in both, the same general relation between the blackening of the ferrous core, and the breaking down of the oxidized exterior seems to prevail. That is, the red oxidized portion of one clay may break down from excess of heat, before the black core of another clay may begin to swell, showing that black coring is a phenomenon which is consistent with its own clay, but not comparable, clay with clay. In general, the defect becomes evident just prior to the normal finishing of the kiln. The red portion of the ware is usually approaching its best strength when the black portion becomes so scoriaceous as to attract attention by the change in shape.

Allusion has been made incidentally in many places in the foregoing pages to the effects of this gas evolution. In brief, they involve a swelling or bloating of the black ferrous portion, and a sufficient stretching of the surrounding red portion to accommodate the change in volume. Naturally the extent of this bloating depends on the amount of gas liberated, the increase in temperature after liberation, and the structure of the red portion of the body. If the latter is porous, the swelling will be slight or unnoticeable. If it is dense and impervious, the swelling will be very severe. The action is exactly that of yeast in a loaf of bread, except that it proceeds from a central focus instead of throughout the structure equally.

The practical range which this troublesome defect may take in clay wares is very great. Figure 7 shows two bricks split longitudinally, illustrating a very bad case of deformation. The red ferric shell is about one-half inch in thickness on the sides, thicker on the ends and corners. The black spongy core has generated such a volume of gas that it has created large cavities between it an the exterior. These bricks were made from a carbonaceous, pyritiferous, ferrous shale, by the stiff-mud process. Even this does not represent the maximum. Cases have come under observation where the clay has bloated up three or four times its original volume.

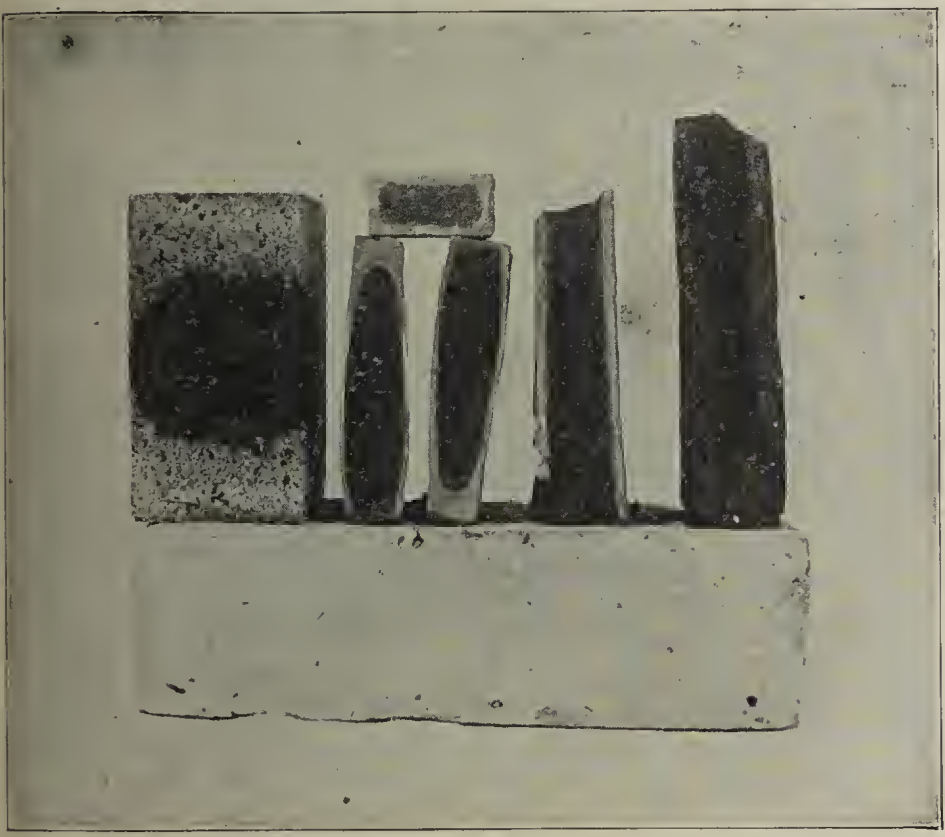


Fig. 8.

A more moderate phase of the defect is shown in Fig. 8. On the right is a piece of red sewer pipe. The blue core is here about one-third of the cross-section, and the gas evolution has been small. Consequently, the ware is not swollen; but it is weak and brittle. There seems to be a very distinct difference between the physical properties of the blue and red, because the ware is invariably weakened by a blue core, even when the vesicular structure is microscopic. This constitutes one of its chief disadvantages; swollen wares can be picked out and discarded. But when they are merely blue-cored, their unsoundness only develops by use. After the failure has come, we see why it came. But that does not guard against its recurrence.

The piece next the right is a beautiful example of change in color, without swelling. It is from a drain tile, made of a tough fine-grained alluvial clay, which would ordinarily speaking be called perfectly safe from such defects. The piece was burned in about 24 hours, which explains the trouble. The two small pieces next the left are trial pieces burnt by students. They show the contrast in a buff clay very prettily, and also show slight swelling. On top of them, is another small trial piece, in which only a faint blue core shows—no swelling. The brick on the left shows a dry-press product, made from fire-clay containing some carbon. It has not swollen, but the brick was so weak as to be rejected from use. In other instances, this defect may represent merely a faint blue line or spot in the thickest and best protected portion in the ware. In such cases, its power to do harm is small.

Summarizing, we may say that failure to oxidize the clay to the center at the proper time, usually results in the failure to oxidize later. The ferrous oxide thus left forms a fusible silicate at a temperature when the well oxidized exterior is only becoming well vitrified. This fusible silicate evolves gases, in greater or less volume, which tend to swell the ware. In cases where the amount of fusible silicate is small or the gases are not abundant, the discolored core does not swell, but weakens the product by unequal expansion and contraction.

Blue Stoning, or the Normal Change in Color by Increase in Temperature. With this phenomenon, every clayworker and many ordinary observers outside of the clay industry are familiar. With its cause, few if any can claim knowledge. The writer acknowledges that it has gone no farther than speculation with him.

The brick shown in the bottom row in Fig. 9 are red-burning paving brick. All are thoroughly vitrified in the usual sense that clayworkers use this term. None of them would absorb more than a fraction of a per cent. of water. But the left hand one is red as liver, the middle one is dark red, almost a chocolate, and the third is of a purple or violet color. In the upper row, on the left, is a buff fire-clay brick; next, the same changed to a soft blue-gray tint, and on the right a darker purple-gray. None of the six samples are in the least swollen or vesicular. None are reduced by gases working on the interior or exterior. They have simply changed color by increase of temperature, being maintained all the while in oxidizing conditions.

It is easily possible to overburn either of these clays, but in the ordinary acceptation of this word, these clays are not overburned. Their strength and hardness and density are about uniform throughout the series. A small increase of temperature would bring an abrupt and marked physical change in both of the right hand specimens, which will be described later on.

What, then, is this mysterious change in color. The writer believes it is the preliminary stage of that breaking down by which the ferric oxide, or ferric compound, whatever it may be, is converted into ferrous oxide by the superior energy of the silica and formed into a ferrous silicate. This reaction, if there is such a one, is brought into full completion during fusion, and its further discussion will be deferred till that topic is reached.

The alternative proposition to which we are driven is that advanced by Seger, who thinks that the increasing density of the ferric oxide as the temperature mounts higher, is sufficient to explain all these shades between light red or buff and violet-black. He does admit that ferric and ferrous oxide, in different proportions, may cause a wonderful variety of tints. No one would oppose this statement. But, the question arises, how could a densely vitrified mass of clay like a brick, being heated in purely oxidizing atmosphere, generate any such mysterious mixture of ferrous and ferric oxide, after it has once safely passed the oxidizing period?

Whatever its cause, all clays show this phenomenon to a greater or less degree. Sometimes, as in the limy clays, the transition from vitrification to fusion is very short. But in its traverse, however short or long it may be, this mysterious, delicate change of color comes. It must not be confounded with any of the oxidation or reduction phenomena discussed heretofore.

Reoxidation, or Flashing. This topic has already been discussed by Bleininger and others, and will therefore receive but a word here. It has been shown that where a clay is frequently subjected to alternate oxidizing and reducing conditions, that it shows a change in color, which is superficial if the ware is vitrified and dense, and entire when the ware is porous. This color is that produced by ferric oxide, only darker and stronger. In a buff clay, it is golden, russet or brown. In a red clay it is chocolate or almost black.

It has been shown that this color can not be developed by a continuously oxidizing burn. It requires reduction, *followed by oxidation,* to develop it. The more times this change occurs, the more brilliant the color and the easier it is to develop. It also requires that the reoxidation shall be as well marked as the reduction. A cooling under reducing conditions, or a very short or sudden cooling, leaves the ware in its reduced or ferrous color.

These facts are now well in hand and of commercial use among the numerous class of clayworkers who are producing flashed brick, and similar wares. I propose to dwell for a moment on another phase of the subject which is never produced with intention, which is counted a defect, and which is generally not comprehended by those who encounter it.

The two bricks shown in Fig. 10, were made for buff bricks. But in the center of one, and on the side of the other, is a zone of distinctly pinkish color, quite widely different from the clear cream color of the rest of the ware. These pink spots were reduced in the burn, but not by gases and under the burner's control, as in flashing. They were reduced by the carbon in the clay itself, which was in a way fixed or "set" in the clay by too sudden heating. It is not unlike the way that a dye sets in a fabric under the influence of a mordant.

Carbon, especially that of the bituminous type, is very difficult to handle. It is apt to catch fire, and raise the heat too fast. Or it is likely to decompose, or "crack" and deposit a fine coke in every pore of the clay where it can only be burnt out with the extremest care and plenty of time. But, by slow firing, by cutting off the air supply, by use of grog or grit in the body, and similar means, this may be overcome or avoided.

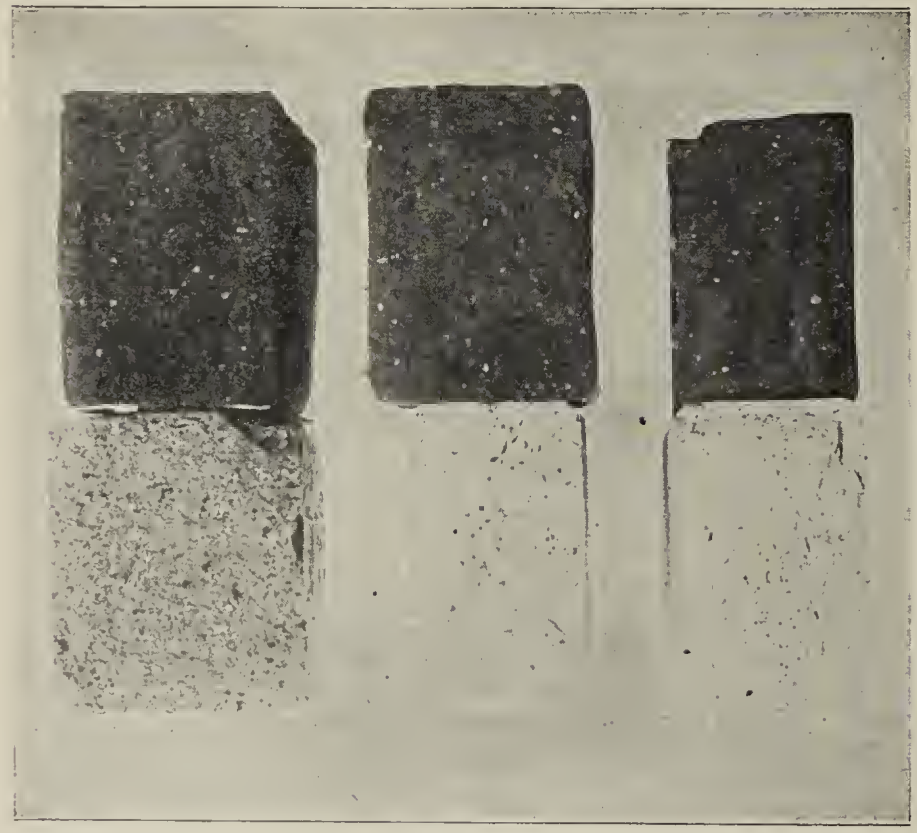


Fig. 9.

If carbon is once allowed to remain in the clay till a good red heat is reached, when its effect is inevitable. It will reduce the iron. If this be carefully reoxidized the black core may be obviated. But the reoxidized iron will no longer take the same color, as the exterior shell. It takes the redder, stronger tint instead. Thousands of face brick go for seconds every year on account of this defect, which could be avoided by a little more care or a little more understanding of this simple fact.

Phenomena Occurring after Vitrification or by Reason of Excessive Heat.

The natural end of the heating process is fusion. But clayworkers only push their process to this extreme by accident. In the very large majority of cases, the substance produced by the fusion of the clay as a whole, is distinctly refractory. That is, it does not melt readily, compared to slags, glasses, and other artificial silicates. On this account, clays generally pass from vitrification into fusion by slow and insensible stages. This quality is very necessary to satisfactory clay burning. Where the temperature interval is short, as in the limy clays, they become very "unsafe," *i. e.,* the burner must pay the penalty of the least excess of heat with a lot of fused and worthless ware.

The stage known as viscous vitrification is the form of overburning shown in the great majority of cases. The limits of this state are defined, first, by the point where the clay ware is no longer able to resist the pressures which it has to endure under normal kiln conditions; second, when the ware is unable to endure its own weight and sinks out of shape by gravitation alone.

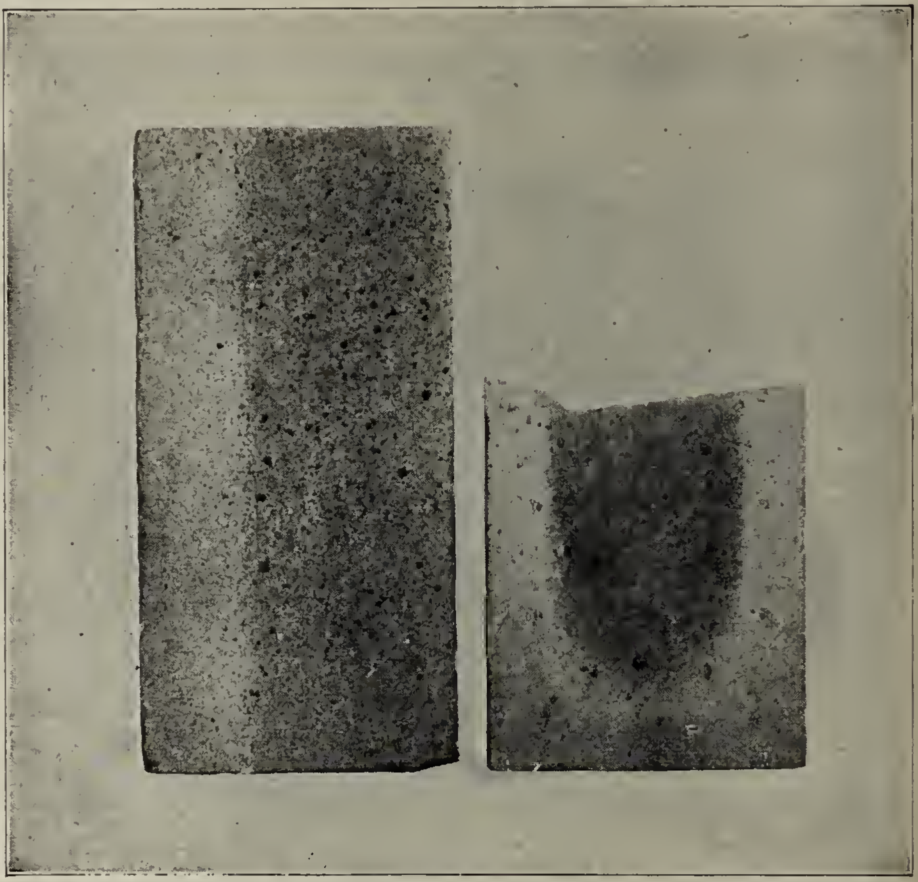


Fig. 10.

In dealing with the different products the setting is managed on so widely different plans that normal kiln pressures are not comparable. A paving brick carrying the weight of thirty superincumbent courses is certain to sink out of shape far earlier than a piece of pottery in a saggar. Therefore viscous vitrification does not mean the same stage of fluidity in different products.

In no clay do the whole mass of the minerals arrive at fusion simultaneously. In vitrification we must conceive of a mass or skeleton of rigid unfused minerals greatly in preponderance, permeated by a small proportion of fused silicate matter. This latter is enough to tie the other materials together, to render the mass harder and stronger, but not to cause it to lose its shape. But, as the process goes on, the proportions of stiff rigid matter and fused matter are gradually reversed. The point at which ware yields to kiln pressure and deforms, therefore, depends (*a*) on the proportion of coarse-grained relatively infusible, insoluble minerals which will act as the skeleton or frame to resist change of shape; (*b*) on the kind of a solvent fluid slag which is attacking this skeleton and undermining its power to resist; (*c*) on the pressure or weight to which the ware is subjected.

The nature of the breaking down process has been discussed already, in connection with black coring and blue-stoning. The exact nature of the chemical compounds which fuse first, and thus lead to a fusion of the clay as a whole, are not known. It is not likely that they are the same in many cases. Or, rather, that the total number of minerals which may form in a fusing clay is large, but that the proportions of each in any given case are not likely to be duplicated by any other case. It is probably a case of solution of one silicate in another, and in many cases we are not likely to resolve the question of proportion in the near future or by existing means.

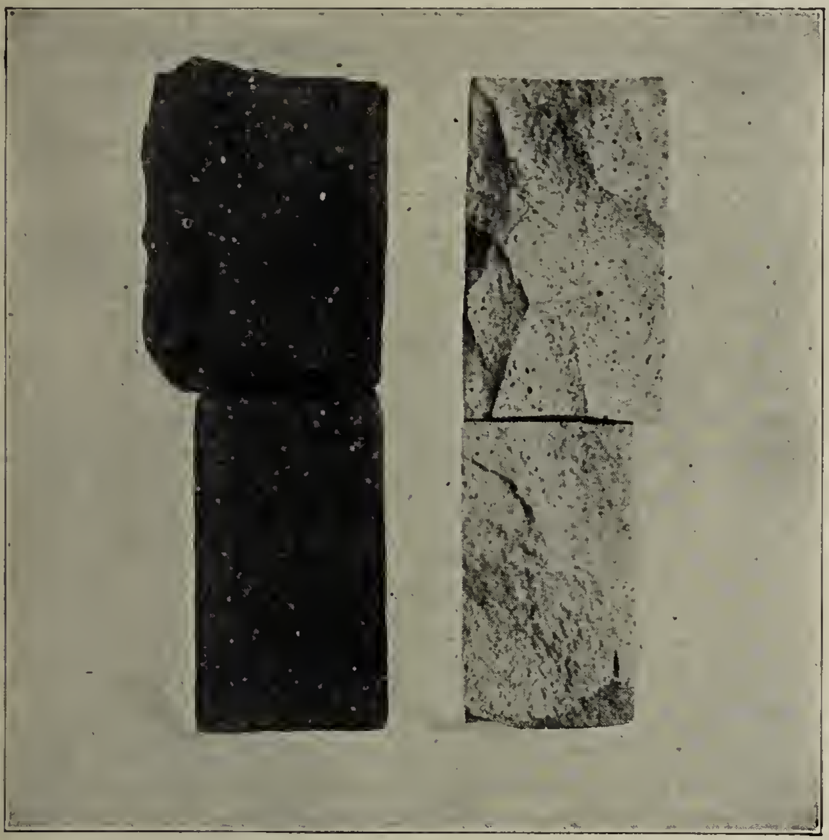


Fig. 11.

There are two facts in connection with the breaking down of a clay by heat which are noteworthy, viz: the development of the vesicular structure, by gas evolution, and the change of color. These two phenomena are not invariably manifested, but only in very rare instances do they fail. The clays which fuse most quietly are white-burning bodies using lime as a flux. The writer does not recall a red or buff burning clay which fused without gas evolution.

The explanations given of gas evolution in the formation of the ferrous silicate at lower temperatures hold good here only in part. The chief difference is in the quantity and nature of the gas-forming substances still left in the clay. Water and probably CO_2 are now ruled out. The clay having been thoroughly oxidized and thoroughly vitrified, is supposed to contain nothing further combustible or readily volatile. There are two other sources of gas remaining: first, SO_3, from the breaking down of sulphates, which are known to resist decomposition much more tenaciously than carbonates or any other salts found in clays; second, oxygen, derived from the breaking down of Fe_2O_3 to $2FeO$, before passing into silicate combination.

The Vesicular Structure Produced by Sulphates. Beyond a doubt, this swelling is a common and important cause of the breaking down of clays. In Fig. 11 are shown two cases. The fire-clay brick has become minutely cellular, and has increased in all dimensions about equally. Fusion has not set in; viscous vitrification is admirably represented. But the brick has lost its hardness, strength and density to a considerable extent. Its color is not materially changed. This seems a typical case of sulphuric acid swelling.

The red brick is a dry-pressed ware made from a pyriteferous clay. It has swollen much more, and less regularly than the other. It is fused, rather than in the stage of viscous vitrification. It also has lost strength, hardness and density. Its color has changed somewhat, *but is still red.* The entire absence of darkening in the center proves that the clay has been fully oxidized. Moreover, its heating has been but little above the point of complete vitrification. The other end of the same brick was sound. This also seems a clear case of sulphuric acid swelling.

The Oxygen Hypothesis. The two cases above have been picked out as unusual. Ordinary clay wares blacken extensively in fusion. And their swelling occurs with and in proportion to their blackening. This seems a significant fact. While red or buff, analysis demonstrates their iron to be ferric. But after this breaking down and blackening, it shows it to be ferrous. This change has occurred progressively from outside to inside, as the temperature is taken up from the gases surrounding the ware.

It is hardly possible to explain this sudden change by reduction by gases, which we know operates so frequently at lower temperatures. This might happen slowly and gradually, if the gases were persistently kept reducing. But how could these gases penetrate a dense vitrified structure and reduce its iron in a few minutes? And yet a few minutes of overheating is enough to cause the change.

The writer has long held the opinion that this change in color and in structure has its explanation in the breaking down of the ferric oxide, into ferrous oxide, with evolution of oxygen. This theory accords with all observed facts, so far as they are at hand; its sole weakness is the hypothetical breaking down of the Fe_2O_3 without the aid of a reducing agent. This has seemed improbable to many to whom it has been suggested. But there are many other instances of oxides breaking down by heat alone. If this hypothesis is ultimately proved to be true, it only adds another oxide to the list.

It will lead too far to discuss the whole question of the existence of ferric silicate at this point. But we know at least, that ferrous silicates are easily made synthetically and that ordinary technical and industrial work does not offer similar illustrations of ferric silicates. The breaking down of the iron under stress of high temperature, and the action of silica in immediately forming the black silicate seems to more adequately explain the observed facts than any other theory yet advanced.

In the preceding pages, the writer has marshalled the principal facts concerning the behavior of iron in clay burning as they have appeared to him. In closing, he wishes to repeat the opening remarks, to the effect that there is much more of opinion than research in the paper. If it suffices to show the very numerous gaps in our exact knowledge of this important and fascinating subject, and inspires in the mind of any the desire to unravel any one of these problems, it will have answered its purpose well.

A Kindly Expression.

Editor CLAY-WORKER:

Enclosed find our check for one year's subscription to the best paper published in the interest of the brick and tile makers. We have read the letter from L. E. Shaw in January issue. Mr. Shaw seems to be having some trouble with the Stewart patent kiln and appeals to your readers who have had experience with this kiln for help. We have been using Stewart kilns for the last four years with marked success, and would be glad to help Mr. Shaw if we knew the source of his trouble. If his kiln is rightly constructed and he sets his bricks properly and understands operating the kiln, we see no reason why he should not succeed in burning his brick as hard as he desires. We have found this kiln very simple and easy to operate and have no trouble in burning our ware to any desired degree of hardness and uniformity of color throughout the entire kiln. We note that Mr. Shaw contemplates a tour among the manufacturers of your State, and if he will pass this way we will take pleasure in showing him our kilns and the products from them. NELSON BROS.

West Manchester, O.

LAND DRAINAGE

BY J. J. W. BILLINGSLEY

A FEW CHANGES IN THE TILE BUSINESS IN THIRTY YEARS.

FROM SMALL, crude temporary factories, to large, well arranged tile works. From hand and horsepower factories to steam power.

From air or sun drying to steam or hot air furnaces.

From horse shoe, flat bottom, octagon or collar tile, to round tile,—exclusively.

From one and a half, two, three up to eight inch in sizes, to from four to thirty inch sizes, the larger sizes being cut two feet lengths.

From small, hand and horsepower tile mills, to large durable, automatic machines requiring steampower.

From one-story tile sheds, slat rocks to two and three stories, slat floors, elevators, etc.

From summer and fall factories to all the year round, and in some instances running day and night.

From factories supply in a neighborhood selling by the wagon load to sales of car load lots which are shipped, in some instances hundreds of miles.

From a haphazard, unmethodical business to a methodical, strenuous calling, requiring thought, skill and keen business precept.

SOME CHANGES IN USE OF DRAIN TILES.

The flat bottom tile, or tile with collars—the collars being cut from four to six inches in length and were made large enough to receive the ends of the drain tile,—they kept the joints in line and were supposed to keep out silt in part, or larger particles of earth—they are seldom used now.

Sizes in common use thirty or forty year ago ranged from two inches to eight, seldom larger than six inches. Two and three-inch sizes were mostly in demand. Now few are used smaller than four-inch up to twelve-inch sizes. Above twelve inches up to thirty is used for largest main ditches, which includes those used in putting open ditches underground.

DEPTH OF DITCHES.

The very common depth of ditches thirty years ago was twenty to thirty inches—two feet being quite common. Now the depth ranges from thirty inches to four feet. If the necessary outlet can be had at a reasonable cost. Few are laid out at a less depth, except where the parties are not informed as to the benefits of deeper drainage.

MORE THOROUGH WORK.

One or more lines of tile in a field, depending on the number of draws or depressions, were thought sufficient, and many of these were too small to allow lateral or side drains to enter into them. Now the first lines of tile are laid for main and sub-main ditches, embracing the extension of the work so as to include all of the water that may flow on a given area of land shedding its waters to the main drain. A notable fact in connection with the advance that has been made in the use of drain tile, is that however much the increase in the amount of labor required and in the money expended, the more thorough work has amply repaid the effort and expense, and is regarded as a wise investment of labor and money as an unfailing source of profit in the future of the work. So far, no one has reason to regret the labor and money expended for good drainage, however thorough the work done.

A FEW APHORISMS IN THE TILE BUSINESS.

Clay is the most important factor in the tile business.

The mill that is paid for, does the best work.

Feed your trade and your trade will feed you.

Sell only good tile. How? By making only good tile.

The best kilns will not turn out good tiles which are poor when set.

Well dried, smooth, even tile, pressed from good clay, rightly set in a good kiln, an experienced burner, and plenty of fuel, are conditions not likely to foil in the production of good tile.

There is much to learn in the management of clay in the tile business.

Profit by the experience of others. Yes, but get the knowledge of their experience first.

When the air around the drying tile has taken up all the moisture that it will hold, get rid of the moist air that drier air may take its place and the drying go on—in one word, ventilation.

WHAT DRAINAGE DOES.

The late John H. Klippart condenses the benefits of tile drainage under the following twelve heads.

1. Drainage removes the stagnant water from the surface.
2. It removes the excess of water from under the surface.
3. It lengthens the season for the better maturity of crops.
4. It deepens the soil, that the roots of growing crops may penetrate the earth deeply for food and moisture.
5. It warms the soil.
6. It equalizes the temperature of the soil during the season of crop growth.
7. It carries down soluble substances to the roots of plants.
8. It prevents "heaving out" or "freezing out."
9. It prevents injury from drouth.
10. It improves the quality and increases the quantity of the crops.
11. It increases the effectiveness of manures.
12. It prevents rust in wheat and rot in potatoes.

THE FARMER AND THE AUTOMOBILE.

The Versatility and Practicability of the Horseless Carriage Shown by South Bend Manufacturers in a World's Fair Exhibit.

The automobile will not milk the cow nor tend the baby, but it will churn the butter and grind the cornmeal and do pretty nearly every other kind of work on the farm. After the farmer sees the exhibit of farm implements made by the manugacturers of South Bend, Ind., at the World's Fair, to which the *South Bend Tribune* calls attention, and in which the automobile plays a stellar role, much of the antipathy formerly felt by the ruralist for the horseless carriage will be removed.

Of course the South Bend manufacturers will not neglect the auto as a pleasure vehicle, but it is the uses to which the machine may be put on the farm that will prove most novel and interesting. An automobile with a plow attachment will be in operation, showing how much faster the soil can be turned with the new power than when the plow is drawn by horses. The automobile harrow will make Dobbin turn green with envy, so much more smoothly does it glide over the field. Another exhibit will show the automobile used as a farm wagon. The practicibility of mowing hay and cutting wheat with agricultural automobiles will be demonstrated. The traction engine used by threshers has paved the way for the automobile in this field and it will not appear as so great a novelty.

The versatility of the automobile will be demonstrated when it is seen, as it actually will be, in the Palace of Agriculture, grinding grain. The same machine that conveys the farmer and his family to church on Sunday, may be placed in the barn on week days and the wheels as they turn upon certain rigging in the floor will grind the farmer's grist.

This is not all of the uses the automobile may be put to on the farm. There are many others and all will be shown at the World's Fair. South Bend is a great manuacturing center, and she will make an exhibit that will call attention to her importance.

DITCHING THROUGH QUICKSAND.

To curb the sides against quicksand in digging a ditch: Take two pieces of (inch in diameter) round iron or gas pipe, eight or more feet in length, and bend to the form of an ox-bow; bolt boards five or six feet in length onto the sides of the bow as high as needed, having the bows near the ends of the boards In digging the ditch, when the quicksand is reached set in the curb and sink it as the depth increases, until the required depth is obtained, then lay the tile and fill in on the sides of the tile until they are secure; then the curb can be drawn and set forward, and so on. There will be no trouble in working the curb.

A LARGE DITCH.

It is reported that the necessary preparations have been made, to construct a large ditch in Lee county, Ill., which embraces the straightening of Green River a distance of ten miles. When completed it will reclaim about $10,000 acres of rich agricultural lands. The work will commence this spring as soon as the ground has thawed out, and will be pushed to completion as soon as possible.

A BIT OF EXPERIENCE.

A German gardener of New York, leased ten acres of land near the city that proved to be boggy, and the first three years his crops, in spite of all the attention he could give them, barely paid the rent and supported him. He was advised to try drainage and although but seven years were left of his lease, he did it at a cost of $500. The result justified the expense, for in the remaining seven years of his lease, he made over and above all expenses, money enough to pay $12,000 for the land that he had leased.

PETITION FOR A BIG DITCH.

R. A. Kauffman and others have petitioned the Huntington County Circuit Court for the improvement of Clear Creek, a tributary of the Wabash River, at a cost of $100,000. The petition includes the improvement of $70,000 acres of land. The proposed ditch will be forty miles in length and will have eleven branches. Branches and main channel originate in Whitley County. The improvement, if made, will reclaim a large area of land and add much to the value of these lands for productive use.

TILE NEWS NOTES.

If a man has a mortgage on his farm and it has three or four years to run, by paying the interest, my advice to him is to "tile it off." That's the way, and it's the only way on a wet, cold clay soil.—*Peter Simple.*

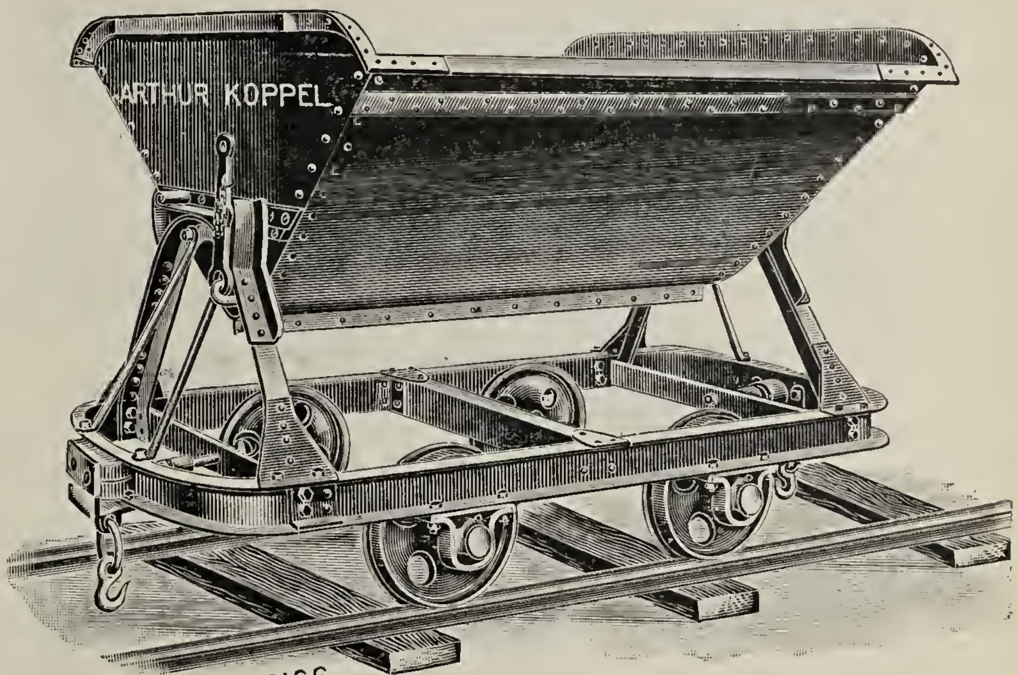
We have known farmers to borrow money to build fine houses and other people live in them, but we have never known an intelligent, industrious farmer to borrow money to underdrain his land that did not succeed in growing good crops and prosper in his business. Drainage pays.

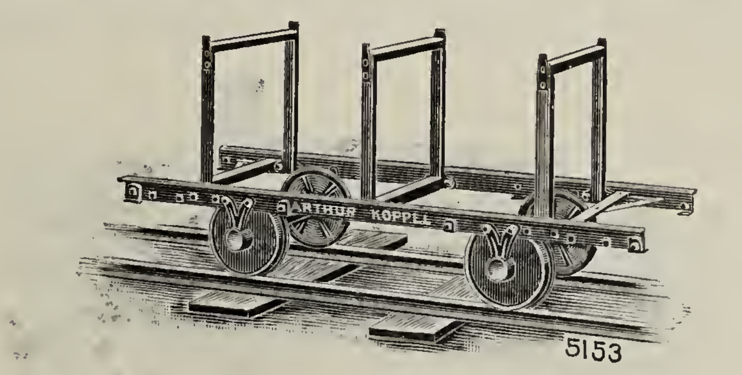
A correspondent writes: "Our land here is not so level, but high in price, ranging from $75 to $125 per acre, and most of it could be doubled in value for crop production by thorough drainage, for much of it is heavy clay soil." By all means tile drain it. (Ed.)

Get the stagnant water out of the soil by underdraining it. Then apply manures and rotate with legume crops about every third year to keep up the fertility of the soil, and in so doing grow maximum crops, crops that pay satisfactory returns.

INDUSTRIAL RAILWAYS.

EVERY INTELLIGENT manufacturer seeks to reduce his labor cost and is always alert to discover and install new appliances adapted to secure this end. In transporting materials in process of manufacture, distributing coal to furnaces, and removing ashes and waste of all kinds, there is much to be learned from the manufacturers of industrial railways. The largest manufacturer of these railways and of the cars that run over them is the firm of Arthur Koppel, 66-68 Broad street, New York. This concern was the first to manufacture industrial cars on a large scale and subsequently to specialize the manufacture of these cars. The requirements of every large industry have been studied, and cars of special design or with special devices for loading and unloading have been constructed. Similarly ingenious devices have been devised in the way of turntables, turnouts, switches, and crossings, so that the most use can be made of tracks when laid.





The cuts herewith show some of the cars of special design. All of the cars made by this firm have special running gear, enabling them to be moved and operated in contracted and crooked places. The tracks are so built as to present the least possible obstruction. The aim in all directions is to facilitate and economise in the handling of heavy or bulky objects. The catalogue of Arthur Koppel shows the great diversity of product made and will be sent on request, but it is not the last word in the business, as the firm is always ready to devise a plant to meet special conditions or for new purposes.

BRICK DRYING.

The Waste Heat System of the American Blower Co., Detroit.

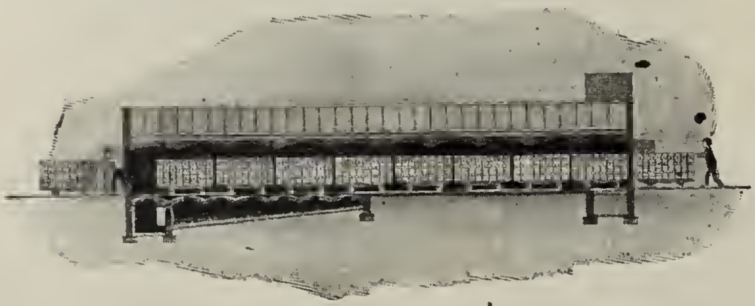
TO DRY clay rapidly and economically two factors must ever be present—heat, to volatilize the moisture in the clay and drive it off into the surrounding air as vapor; circulation, to carry away this vapor as quickly as possible before the air becomes so impregnated with moisture that it will be deposited on cooler substances or surfaces.

To accomplish these results quickly, economically and continuously requires extensive scientific investigation, long practical experience, and the most careful engineering.

The temperature which the different clays will stand and the circulation necessary for a given temperature are learned only by scientific investigation.

How to apply the heat and circulation so as to get the full benefit from both without doing injury to the product, can only be determined by practical investigation.

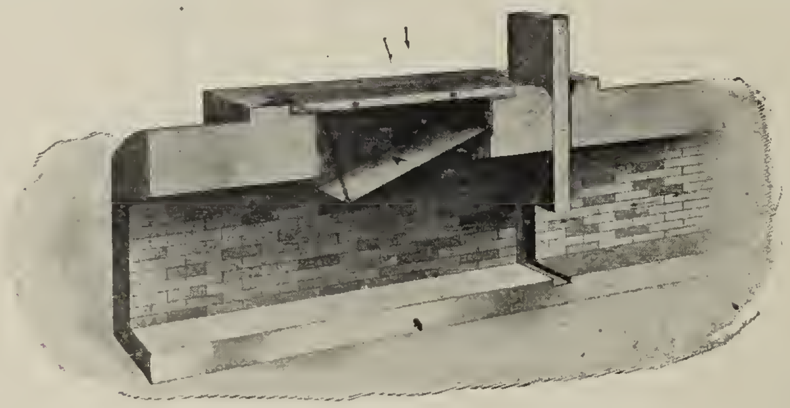
We are pioneers in the drying of clay products, having had over a score of years' experience with steam dryers for every kind of drying, and having designed and installed the first modern and successful Waste Heat Dryer ever built. With our large and thoroughly competent engineering force we have kept in close touch with the requirements of the trade, and by improving the system wherever possible, we have today as our regular customers the largest, most representative and successful manufacturers in the country.



Sectional View of an "A. B. C." Dryer.

DESCRIPTION.

The "progressive principle," or continuous car system, is quite universally adopted as the most practical method of handling bricks during the drying period. This consists of long tunnels or compartments into which the cars of wet bricks enter at one end and when dried are removed at the other end. The heat is introduced at the end where the cars are removed, and the saturated air escapes at the end where the cars enter. These tunnels are always kept full of cars, by immediately supplanting those dry enough to remove with cars loaded with wet bricks. Thus the drying process is continuous.



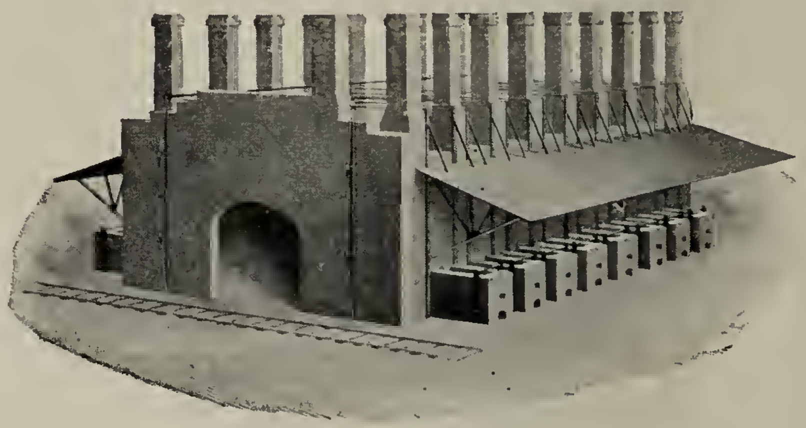
Arrangement of Dampers in an "A. B. C." Dryer.

The heat required to volatilize the moisture is obtained from the kilns which are cooling. After the fires are out, a kiln holding 200,000 bricks will throw off more heat than a 100 horsepower boiler would require for two weeks' operation. Yet before the discovery of the modern Waste Heat System, this enormous amount of heat was entirely wasted.

Any temperature best suited to the material being dried can be maintained, ranging from the temperature of the outside atmosphere to 500 degrees, or more. It is always within easy control by the manipulation of one or two dampers.

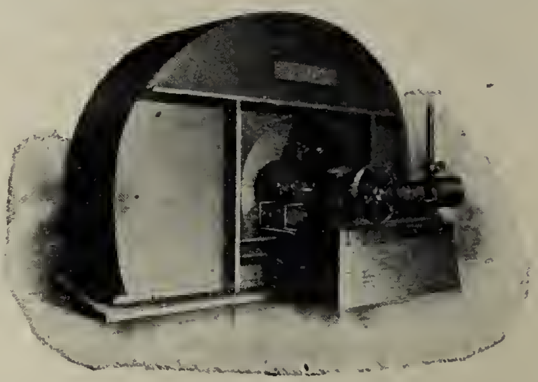
The circulation of air which is necessary to carry off the moisture is produced by one or more Fans or Blowers. The motive power can be either a steam or gas engine, or an electric motor.

The circulation is constant, and by this system the distribution of the air is uniform. It can be increased or diminished at will, by increasing or decreasing the speed of the Fan.



The Source of Heat Supply.

The length of time required to dry the various clay products depends upon many things and varies from ten hours to four days. Some bricks will dry in eighteen hours, whereas others will require sixty hours, or even longer. Any clay running high in alumina must be dried slowly, or it will check badly. Soft mud bricks dry slower than stiff mud, even if there is no moisture in them and other conditions are favorable, because they have to be hacked on pallets. Fire-proofing material can be dried very rapidly because of its porous nature and thin mold. Large architectural terra cotta blocks require a long time because of the density of the clay and the difficulty of making the heat penetrate to the center. Pottery dries fast or slow according to the size and thickness of the mold.



An "A. B. C." Blower.

It becomes apparent at once that careful judgment must be exercised in designing a drying plant in order to obtain the highest possible efficiency and that without experience the best judgment will be of little value in designing a plant of this character.

To more thoroughly appreciate the convenience the system affords, we will amplify the more important items in the order enumerated.

The dryer building proper is the same in general construction as any dryer which is built to operate on the "progressive" principle. It should, however, be built strictly fireproof.

The circulation and temperature being readily controlled, makes the system adaptable to any clay, climate or atmospheric conditions.

There is nothing requiring attention but a small engine, and as this needs no more care than any engine, the possibility or probability of a "shut down" for repairs is more remote than with any other system of artificial drying known. There are no steam coils, valves, pumps, traps, etc., requiring constant attention, repair and replacement. There are not a score or more of fire-boxes, furnaces, etc., with grate bars, etc., to burn out, needing new linings, or that clog up, cave in or otherwise become defective.

By the "A. B. C." Waste Heat system bricks can be dried *thoroughly bone dry*. Being perfectly dry eliminates the necessity for "water-smoking," saving anywhere from two to four days' time. Further, the bricks being dry, the temperature of the kiln can be raised more quickly and the time required to burn is thus reduced. Again, by drawing away the heat as radiated from the cooling bricks in the kiln, reduces the time ordinarily needed to cool a kiln. The collective saving of time for the different operations increases the output of the entire plant very materially.

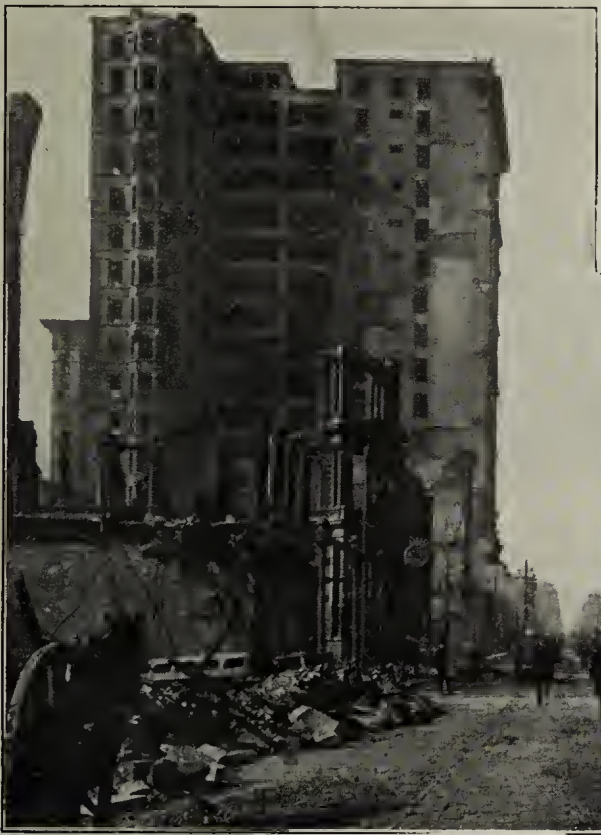
The quality of the product turned out is improved in every way, when compared with bricks dried by natural methods or by any other artificial drying system.

As the bricks are *bone dry* when set, there can be no discoloration and little liability of burning an uneven color due to the chemical action set up by the vapors mixing with the gases from the fires. Again, bone dry bricks are much stronger, hold their shape better, can stand rougher handling without injury, there is a lower percentage of loss, and no possibility of "kiln marking" by settling under their own weight in setting.

The bricks burn more evenly throughout the kiln, and by drawing the heat down, the bottom can be burned just as hard as the top without running the risk of ever over-burning the latter.

The crown of the kiln lasts longer, as the intense heat is not retained there in the usual manner.

Common sense backed by energy will achieve more than much money.



The Sixteen Story Continental Trust Building But Little Damaged.

Baltimore Ruins. Tile Roofs Would Have Prevented This Enormous Loss.

PHILADELPHIA BRICK AND BUILDING NEWS.

The Baltimore Fire as Viewed by the Clay-Worker's Scribe.

BEING SWEPT by the tide of events, I found myself in Baltimore the second day of the reckless, roaring hell of flames, that pranced and gloated over seventy-five blocks of nearly 150 acres, with the irresistible fury of a wild and drunken horde, from Pratt street to Charles and from German to Light street. My mental notes were made of the best resisting qualities of brick and terra cotta versus stone, granite, limestone and marble, cracking, spalling and popping. These latter materials offered little or no resistance to the wild consuming heat which in a concentrated form, must have been nearly 3,000 degrees Fahrenheit. Taking the new Carrollton Hotel on Light street, these walls were almost entirelv of brick, and, notwithstanding that this was directly within the fire zone's fiercest heat, the walls stood, while the banking house of Alexander Brown & Sons, designed and built upon the colonial lines of well burnt headers and stretchers, stood well, and with little facial injury against the fiercest flames that ever shot across a Southern sky. As a direct antithesis, the loftv graceful, 16-story Continental building on the southeast corner of Baltimore and Calvert streets, was swept as easily as a box of matches. This being the tallest building in the city, men waited with the hope that this would halt the onslaught of the fire demon. Alas! No! In a short time all that was left was the structural part, which I learn on good authority, they will use again, thus saving 40 per cent on the cost of the rebuilding. Recollect, all bolts and rivets have been subjected to nearly 3,000 degrees of heat. The question remains to be answered, will it stand? The Union Trust Company's building at the Northwest corner of Charles and Fayette street quickly succumbed. The marble splitting and popping in chips running from a two-inch to a twenty-inch chip, until nothing but the skeleton remains to tell the story of its past glory. All that section wherein was located the Baltimore Brick Company's offices, and our friend Classen at Bowly's Wharf, with its historic association, was wiped out as by the guns of an enemy.

With the arrival of the State Militia, the crowd was forced back, and only under the lurid glare and more hidden moon, was I enabled to pass the picket lines of Baltimore and Pratt streets, to take a last glimpse of Baltimore's burial place of her past business center.

Time and train carry me away up through the states, and behold! I am face to face with the winter's ice and snows of Reading, Pottstown, Wilkesbarre and Scranton. All the brick yards at those points were dull and in fact frozen out.

AT PHILADELPHIA.

Here in Philadelphia short haulings have become the fashion, and I don't doubt our brickmakers welcomed the date of the convention, since it enabled them to break away from a scene of inactivity and mental monotone.

The first returning delegate to greet me was William Conway, who in a tidal burst of enthusiasm, gloried over the wonderous make-up of the January and February numbers of The Clay-Worker and the happy issuance of the Convention's business and especially the social side.

While they are lying low there at Fifty-eighth and Walnut streets, the prospects for the spring and summer trade give a strong glow of hope that the tide will reach the high water mark of last season, when it overlapped the ten million output. The Carrolls at Fifty-eighth and Girard Avenue have been hemmed in by Jack Frost. The many real estate opeations around, running into hundreds of two and three-story dwellings, have been practically put out of the business. Consequently their haulings have been short, not more than one hundred thousand since Christmas.

Many of the plants, with a fear of a coal strike pending, have resolved to hold much of this stock in reserve. If this is done, June or July will find the Philadelphia market cornered in brick. Baltimore is unable to send any, and Wilmington has already made overtures to Philadelphia men for supplies, only to be turned down.

The Chapman Company are practically without any, and are calling upon other yards for assistance.

McAvoy & Morris are working, but to the tune of twenty thousand a day instead of sixty.

Webster & Keyser are likewise making shipments to the tune of 300,000 for this year. They will, however, hold up a reserve stock of about one million and thus have a safe seat in the event of the strike being declared.

At the regular meeting of the Philadelphia Master Builders' Exchange, held in the Exchange building, Seventh street near Market, February 8, the following officers were elected:

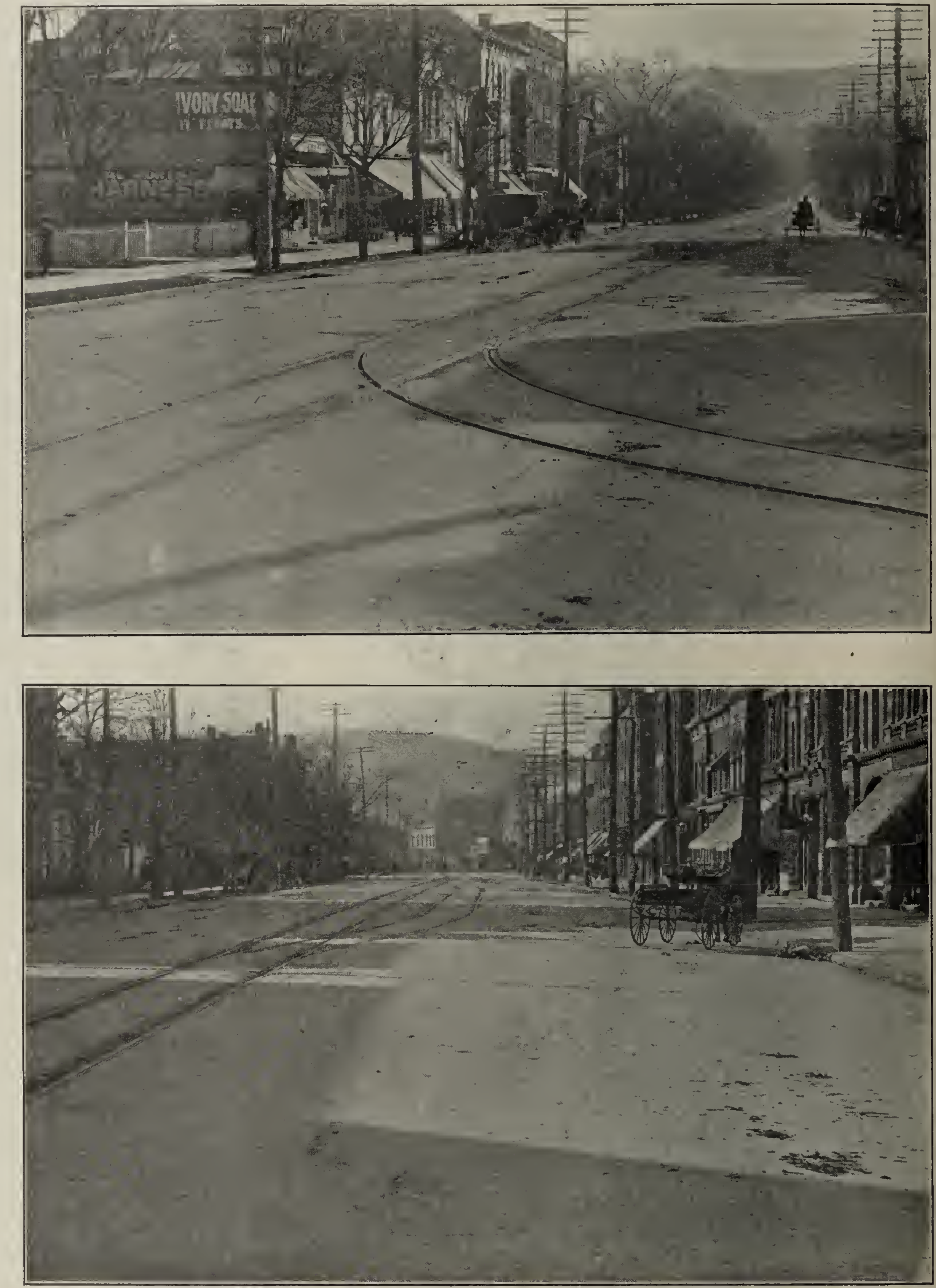
President, J. Lindsay Little; first vice-president, Thomas F. Armstrong; second vice-president, John D. Carlisle; third vice-president, Albert A. Reeves; secretary, William Harkness; treasurer, Henry Reeves.

After the election of officers President-elect J. Lindsay Little was called upon to make a talk, in which he thanked the members for the honor conferred and asked for the hearty support of everyone connected with the exchange.

At the meeting of the Master Builders' Exchange, February 9, the following firms were elected members: James Knowland, The McClure Company, Mann & Gray, Stewart Bros., James H. Shea, Chas. W. Denny, Rittenhouse Quarry.

The application for membership of the following firms are on file: Paine Lumber Company, Stewart L. Bowser.

During the past year the floating debt of the Exchange has been decreased $4,948.20. Official reports show the Exchange to



Splendid Ten-Year-Old Brick Pavements at Hornellsville, N. Y., on Which No Repairs Have Been Required.

have assets amounting to $163,545, and the liabilities amounting to $127,680. Sixty-seven new members were added to the Exchange during the year 1903, making a total membership of 280.

Seven vacancies on the Board of Directors of the Exchange were filled recently by the election of the following: F. M. Harris, Jr., George Watson, John Stevens, W. F. Reynolds, John H. Huhn, William B. Irvin, Cyrus Borgner.

On the tenth of February a delegation from the Master Builders' Exchange went to Baltimore to witness the ruins of the great fire, and study the methods of construction that had been used. Those that attended were: John Atkinson, Thos. F. Armstrong, J. Lindsay Little, James J. Ryan, Albert Reeves, Joseph E. Brown, Frank H. Reeves, William B. Irvine, Chas. Gillingham, Murrill Dobbins, Jos. Steele.

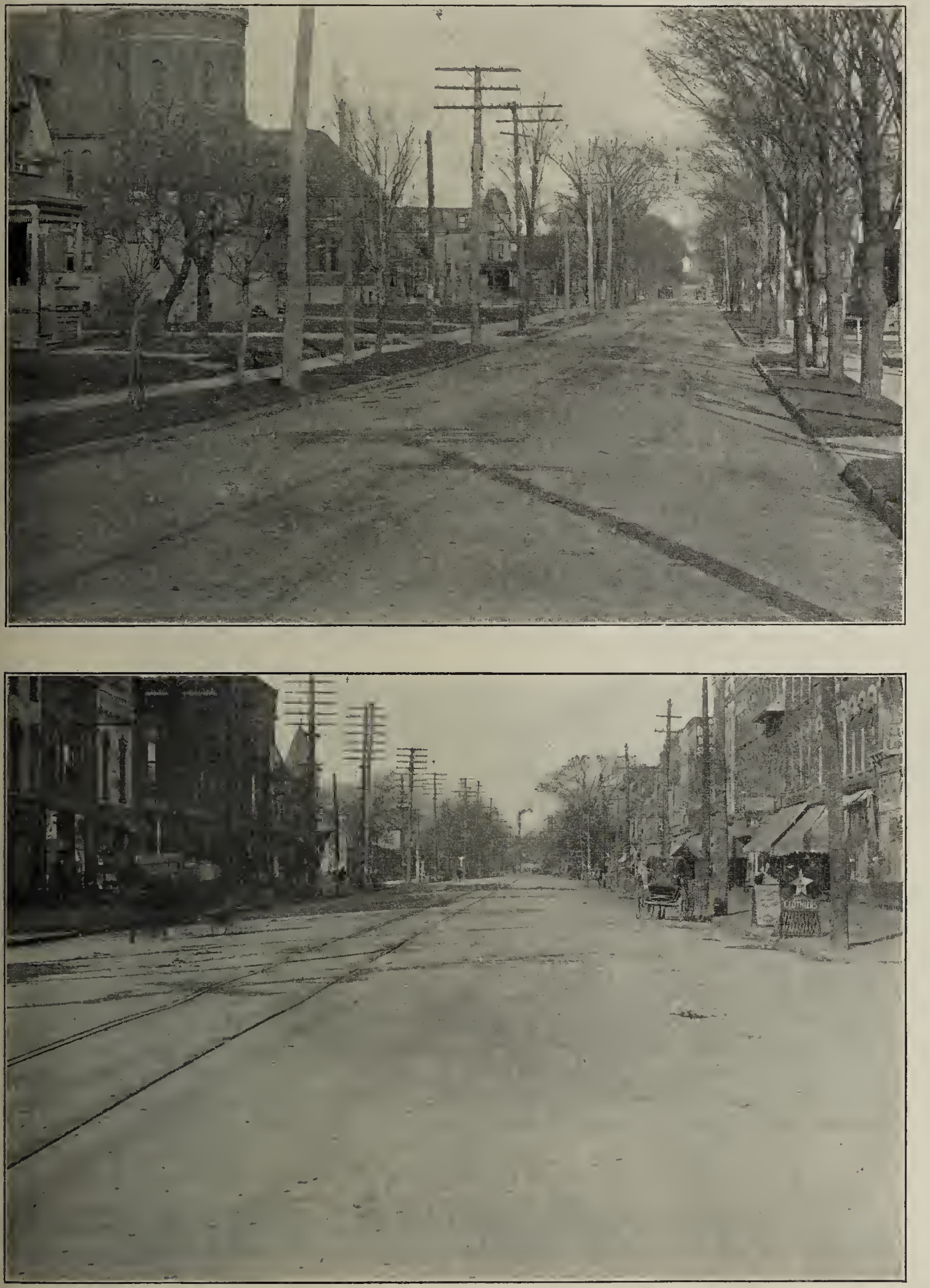
They were accompanied by Former Director of Public Works William C. Haddock and Architect David Knickerbocker Boyd.

W. P. Lockington.

Written for The Clay-Worker.

THE SUCCESS OF BRICK PAVEMENTS.

Splendid Examples at Hornellsville, N. Y.



Views of Main and Seneca Streets, Hornellsville, N. Y., Paved With Preston Brick Ten Years Ago.

WHEN IT is considered that brick were first used for paving purposes in this country but a score of years ago, it is simply wonderful what a lot of paving brick are now used for various purposes. The greater number, of course go into the streets and alleys of cities, but considerable quantities are used for stables, factories and foundation purposes.

It is generally supposed that paving brick as now made and used in this country is a comparatively modern product, but such is not the case in the old country. I was told recently that all through Europe, Asia and Africa, sections of highway and what were once streets have been unearthed and the fact made evident that they were paved with brick. In the old Roman times brick pavements were used extensively, and these same brick which were used for many years and have lain in abandoned highways for thousands of years, deep buried under the accumulation of ages, are now being dug out and used again. Here is an evidence of durability that ought to put to blush the advocates of asphalt, wood block and other paving materials which decay from the effects of the elements, to say nothing of the wear of vehicular traffic.

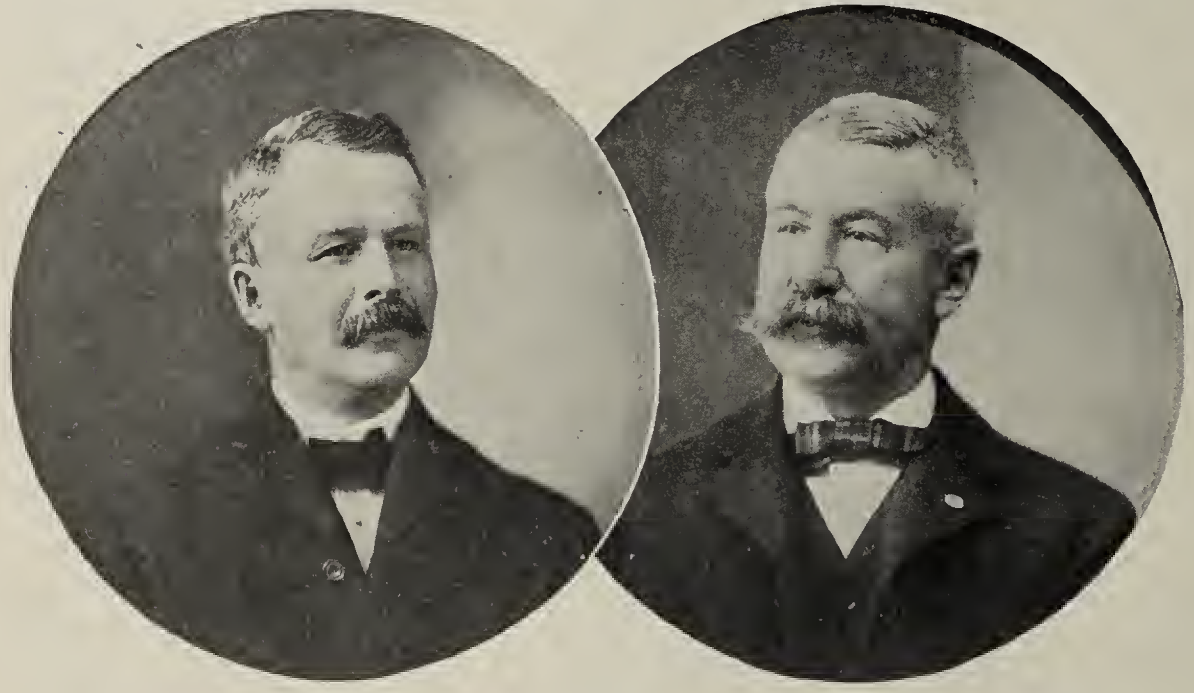
Now in this country, upwards of three thousand cities and towns in different States throughout the Union are engaged in paving their streets with brick. Isn't this really marvelous when it is considered that only a little over twenty years ago the manufacturer of paving brick in the United States began on a small scale. Now, millions and millions of them are used every year, and the demand is increasing constantly because of the merits of paving brick, and not because of the influence of promoters as is the case with competing materials.

Brick pavements in our large cities have passed the experimental stage. Cleveland, Cincinnati, Pittsburg, Columbus, Buffalo, Rochester and Albany, have paved many miles of streets with vitrified brick. Philadelphia, alone, now has about 200 miles of brick streets. The superiority of brick as a paving material is today an established fact. They are not only more durable, but make a cleaner and more sanitary pavement and when properly laid make a smooth pavement over which heavier loads can be hauled with less power than any other pavement.

Not only is brick being used successfully in moderate sized cities, but our great metropolitan cities are using them with equal success. In New York City there is a pavement of vitrified brick on Ninth avenue from Thirteenth to Fourteenth streets which for over eight years has been subject to the heaviest traffic, and today is in fine condition. Not only is a brick pavement superior to an asphalt pavement in wearing qualities, but it is better for grades and is less slippery in wet and freezing weather.

Paving brick are also used extensively for floors in boiler rooms and machine shops, where the lathes, and other heavy machinery are bolted directly to the floor; while for large mills and stable floors it has no equal. Where a large amount of heavy trucking is done, such as about freight depots, it is by odds the most desirable paving material, for while comparatively smooth, it affords a good foothold for draft horses. The United States Government uses brick extensively for paving approaches to public buildings. In view of all this it is safe to predict an immense increase in the demand for paving brick during the coming years.

The accompanying pictures will convey an idea of the excellence of some of the brick streets at Hornellsville, N. Y. These pavements were put down ten years ago. The pictures were taken recently and show that there is but little wear on the brick though the traffic is quite heavy. The brick were made by the Preston Brick Company, whose plant near Hornellsville has been in operation for a dozen years. It is small but a very tidy plant. Evidently, the Prestons pay more attention to the quality than to the quantity of their output. When asked why they did not double the capacity of their plant, Mr. Preston replied, "We are satisfied with a moderate business. It has always been our aim to make and sell nothing but first-class pavers. We pay more attention to quality than to capacity." This is certainly a most commendable spirit. It is little wonder that Hornellsville pavers are popular, and that the demand for them exceeds the capacity of the plant. Undoubtedly this will always be the case or at any rate will be so, so long as they will live up to the motto on their stationery which reads, "Millions of pavers in use and not one has failed to give satisfaction."



Brothers O. and H. C. Preston who Own and Operate the Preston Brick Company, Hornellsville, N. Y.

Valuable Invention for Potteries.

Charles K. Bixon, of 409 Beach street, East Liverpool, Ohio, has perfected an invention which he calls "margerine silver" by combining mineral elements. The combination has the appearance of genuine silver and is to be used in decorating ware in the potteries. The discovery which he made while experimenting in the East Liverpool potteries in the laboratory of the Ceramic Art pottery is the outcome of deep research and years of labor. It is thought that it is destined to create a revolution in the business, through its cheapening facilities and will, when placed upon art ware, give the same results as pure silver. The metal can be used in the jewelers art as well.

Written for The Clay-Worker.

THE FOLLY OF GUARANTEE CLAUSES IN PAVING CONTRACTS.

AT THE TIME the guaranty was established in Chicago street paving contracts, this city was just recovering from an attack of "cedar block." Its civil service was in its infancy, it had an efficient corps of inspectors, and confronted with the necessity for securing some stable pavement, the city officials were compelled to adopt the "guaranty system" on all paving contracts in order to protect the taxpayers and get good work, as well as first-class material.

In the last five years, however, civil service has become thoroughly established, a large force of competent inspectors of work and testers of material has been secured, the engineering corps of the city and the board of local improvements have worked earnestly to secure the best specifications that skill and experience can furnish and the city of Chicago, in my estimation, is now fully prepared to assume the responsibility of putting down first-class concrete foundations, first-class brick pavements, first-class granite pavements, and first-class macadam pavements. On all of these the "guaranty" should be wiped out. The department should assume the responsibility and relieve the property owner of the expensive "guaranty."

And right here let me suggest a doubt as to the legal value of this "guarantee." Suppose your tailor agrees to make a suit of clothes and guarantees them for a year and then you put in a man to inspect the making of them. Your man compels the tailor to use certain materials, he orders the work done in his way, and, in fact, the suit is made as your man orders it, without allowing the tailor any discretion in the matter. Is your guaranty good? I think not. But this is a question for lawyers and the courts.

The city of Chicago now has a well organized force of competent street paving inspectors and material testers, who are paid to see that the work of the contractor is properly done and that the material is of the best quality. It is well known that good work and good material must produce certain results, why then should we add to the burdens of the taxpayer and increase the cost of paving by paying large sums to contractors to guarantee what we already know is sure to result. But if there be those who think the guarantee is of some value, let me ask them if we do not destroy that value as shown in my illustration of the suit of clothes. If so, the people are required to pay for a guarantee that guarantees nothing unless it be a lawsuit.

The small cost to the contractors, up-to-date, for repairs under their guarantees, as well as the small risk to the bond companies on the guaranty bonds, is entirely out of all proportion to the expense it has caused the taxpayers. I am reliably informed that the extra amount these contractors receive for guarantees is no small item; that it would pay the cost of putting down thousands of yards of new street paving if used in that direction; that it would have kept many miles of pavements in repair if used for the purpose; that if never used at all would have been saved to the taxpayer and the cost of paving our streets would have been just that much less.

For these reasons I would advise no further payments for guarantees on granite paving. No further payment for guarantees on brick paving. No further payment for guarantees on block paving or macadam, because in all of these we can determine the quality of the material and work at the time the pavement is laid.

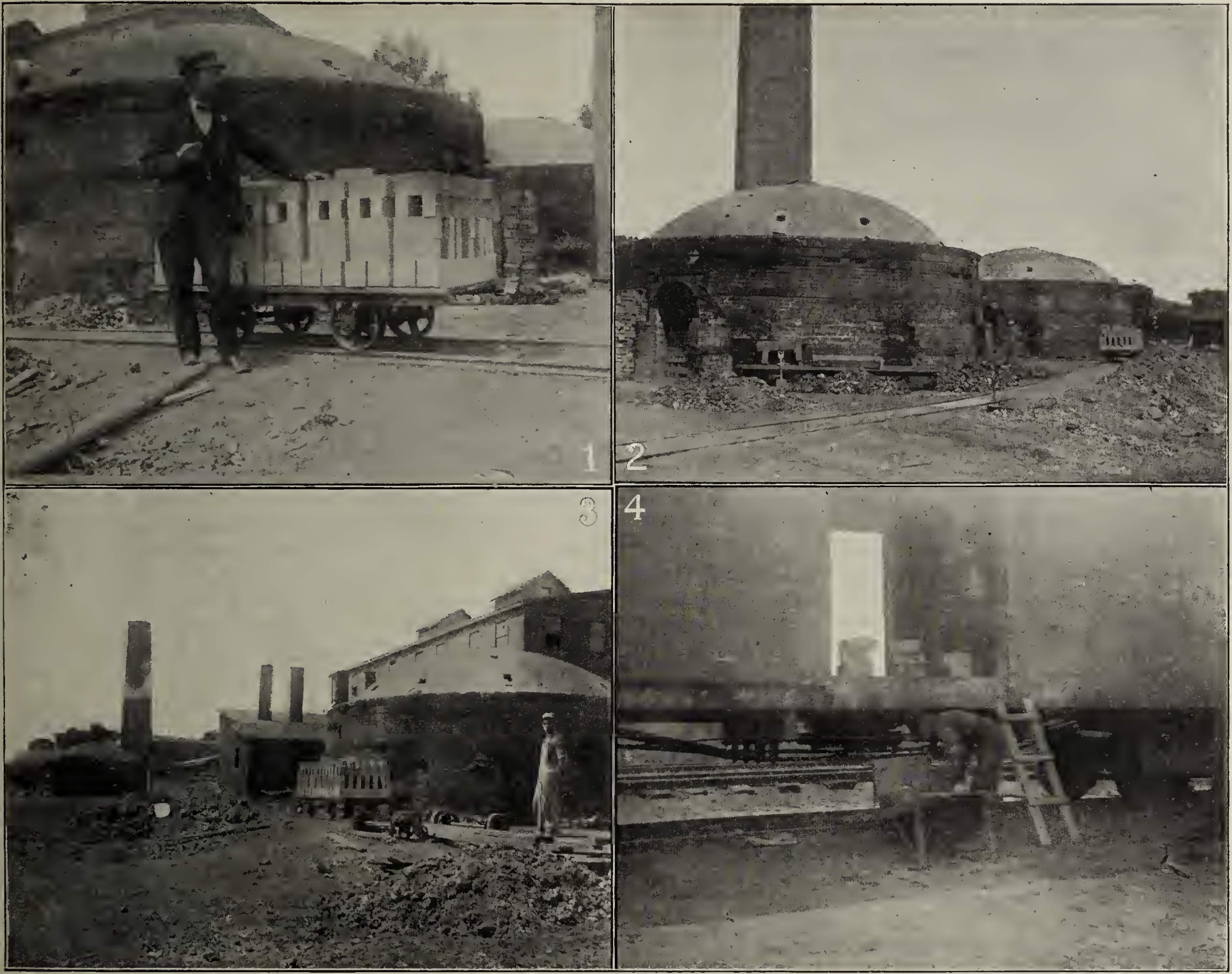
In the case of asphalt paving, however, the guarantee is necessary and should be required because the conditions are entirely different and these make it impossible for inspectors to ascertain whether the asphalt is properly prepared and laid or, even to be sure that it will not be necessary to watch and repair it constantly. The mixing and preparing of asphalt is a trade secret and few men are expert enough to supervise and instruct those whose trade it is to know how the material should be prepared.

Here then we find a reason for requiring a guarantee from the contractor. The taxpayer is confronted with a condition of affairs that compel him to depend upon the contractor's knowledge as an expert in his line and therefore the contractor should be left entirely free to do the work as well as he knows how and then required to guarantee it by keeping it in good repair for a given number of years.

In all such contracts, for asphalt paving, I see no reason why the city inspectors might not rightfully see to it that the street was properly prepared, that the foundations were properly laid and then, with these in proper shape for the asphalt to be applied, his supervision of the work ought to cease and leave the contractor free to prepare and spread the asphalt on his foundation in such manner as will give the best results and be safest for him to guarantee his work by a bonded liability to keep it in good repair. In this way the city would protect the taxpayer as to both work and material in all its asphalt pavements, but concerning which it has no means of knowing anything of the quality when it is laid, and for this reason only, I believe the guarantee is required.

Now there is another matter of some interest. We have been laying brick pavements in Chicago and using a tar filler, with the result that when the sun beats upon it, as it does in Chicago during the hot summer months, and the temperature reaches somewhere near ninety degrees in the shade, this tar filler melts and flows from the center, or crown, of the street into the gutter, thus leaving open interstices in the center of the street, where the pavement is subjected to the greatest wear, and with nothing to hold the brick together they were free to wabble and twist and throw the whole pavement out of shape. Now when we build a brick house we do not use tar for mortar in which to bed the brick, because if we did the house would tumble down the first day the weather man favored us with a hot wave. The same rule applies with equal force to our brick pavements and I understand our city Board of Local Improvements is about to adopt specifications that will require cement grout instead of tar as a filler to be used between the brick in all our streets hereafter paved with brick.

I suggest these ideas because they seem to be fruitful subjects for thought in considering the important question of how we may secure the best pavements for our streets. W. F. Brennan.



Snap Shots at the Tidy Plant of the Preston Brick Company, Hornellsville, N. Y. (1) Dry Brick. (2) The Kilns. (3) Side View of Factory. (4) Loading a Hurry Order.

Too Much of a Good Thing.

Editor Clay-Worker:

The January Clay-Worker is received, and I wish to congratulate you on the same. The only fault I can find with it is that it is something like a Chicago Sunday paper—so large that it is almost impossible for a busy man to read the whole of it. However, I think this number will be read by every brickmaker, and he will be a better brickmaker after he has read it. W. S. PURINGTON.

Written for The Clay-Worker.

NORTHERN OHIO BRICK AND BUILDING NEWS.

THE BRICK BUSINESS for the past month in Toledo was very light, and brick men state that there is very little encouragement at the present time for a prosperous season. Only about 1,000,000 brick were disposed of by the Toledo brick men during the month of March, and, with poor prospects for the future, the local plants will be rather slow in starting up. From Secretary W. O. Dakin, of the Toledo Brick Supply Company, it is learned that Toledo brick yards at the present time contain a stock of about 12,000,000 bricks, which shows that only about 6,000,000 bricks have been sold during the entire winter season. There is very little in sight for the brickmen at the present time as the large buildings now under construction are being built of concrete, and, while there were quite a large number of building permits taken out during the past four weeks, these permits in most cases call for frame dwellings. Very little brick enters into the construction of these dwellings as shown by the permits issued by the city building inspector.

The Findlay Hydraulic Pressed Brick Company and the Ohio Brick Company, which have the Standard dryer system, have just set their plants in operation and will run steadily until the yards become filled up. The rest of the plants use the sun drying process and will hardly be set in operation before May 1, and probably later.

Speaking on the brick situation, A. R. Kuhlman of the Ohio Brick Company, stated to The Clay-Worker representative a few days since that trade looks very discouraging. "The past winter has been so cold," continued Mr. Kuhlman, "that practically no building has been done. At this time of the year the stocks of the Toledo brick yards are usually very low, but not so this season. There is enough brick in stock now to supply the demand until the middle of next August. Another disouraging feature added to the present situation is found in the use of concrete, which promises to be extensively utilized, especially in the erection of large buildings during the coming season. A number of projects are now being considered in which concrete has been decided upon. The J. M. Bour building will be completed solely of concrete material and the Masonic Temple is also being erected solely from concrete and stone. With this change in the use of building material great detriment will result to the brick business generally. The demand for brick in Toledo at present is certainly very small, but we are getting quite a number of inquiries from outside the city, in fact the conditions outside of Toledo point to good spring trade."

Irving Macomber, of the Auburndale Brick Works, said: "We expect to start our plant about May 1. The outlook is very discouraging and present conditions point to poor business for the coming season. However, I hope I may be wrong in my views when the season properly opens up."

All this notwithstanding a building boom seems assured, and, since the weather has moderated, projectors, architects and contractors express themselves as jubilant over the prospects for good business activity. Toledo brickmen would feel equally jubilant if the material to be used in the construction of proposed buildings was to be largely of brick, but such is not the case as many of the structures, especially large ones, will be of stone and concrete, while the smaller buildings will be frame. "Jack Frost" has extended his influence into the earth about four feet and his presence is still a great hindrance to the progress of new buildings to be erected.

Arhitects have been busy during the past several weeks and have turned out a large number of plans. A very large number of these plans are for residences. Toledo is experiencing a great influx of population from the outside world and in view of this an empty house can hardly be found. Moderate-priced residences are in great demand, in fact, the city must have a goodly number of new residences to accommodate the increasing population. From Burton C. Ames, second assistant city building inspector, your correspondent learned that the total amount of permits taken out during the month of February was fifteen, calling for a total cost of a little over $100,000. To show that the building situation has taken on much activity since then it might be stated here that during the past four weeks in the neighborhood of 150 permits, aggregating a total of about $300,000, have been issued. Many of the permits call for small residences, in fact, more than half of the permits taken out call for houses costing less than $1,000. Building operations for the season may be said to have just fairly begun and it will probably be May 1st before building operations will be in full swing. There are a number of large business houses in contemplation, but the final action looking toward the awarding of the contracts has not as yet been taken. Much depends upon the price of building material. In the general market there is little variation from last year and the quotations are really in line with those made last season. Of course there are some advances noted, but these are only slight.

As the first of next month approaches much interest is being taken in what the labor unions of Toledo are doing, as that date is the time when new agreements, wage conditions, and scales for the season usually become effective. Indications of serious clashes between organized labor and capital are not in evidence at the present time, in fact, the labor situation is far more encouraging than it was thought to be some time ago. The only union of the building trades having a new schedule to inaugurate on the first of next month is that of the tinners. The Master Sheet Metal Workers have declared for the open shop, but do not seem to be pushing the fight against the union men very vigorously. But very few tinners are not working at the present time and it may be that no serious trouble will result, however, the tinners may be saving their strength for trouble later on, when the building situation assumes great activity. The Builders' Exchange made a declaration a short time ago that no unions would be recognized this season, so far no indications of trouble in view of this declaration are in evidence. Carpenters, lathers, painters, and structural workers are now well employed after a winter of much idleness. In fact in all the other trades men are reported to be in good demand and the supply is short in some lines. Generally speaking, it is believed that Toledo will have a peaceful and prosperous year with no such repetition of trouble from carpenters and other classes of workmen as was in evidence a year ago.

There promises to be a very large amount of paving done in Toledo during the coming season. Just as soon as the frost is out of the ground there will be great activity along this line. Fully $400,000 will be expended by the city for new street improvements. The city has already issued bonds in the sum of $142,000 to pay its share of the paving work alone. Under the new code it is provided that the city will stand half the cost and the property owners the other half, so from this at least $300,000 is sure to be expended for street improvements, and with the original paving legislation now under way in the council, together with what has been started, will make up an additional $100,000 to complete the estimated total. Already contracts have been let for the paving of Linwood avenue from Woodruff to Bancroft to Leith Bros., at $5,713. The street is to be paved with union pavers, on a foundation of sand, with Berea stone curbing. Garrigan Brothers have also been awarded the contract for the paving of Millard avenue at a price of $17,355. The avenue is to be paved with Harris pavers on a broken stone foundation with Berea curb.

There promises to be considerable money expended for new sewers in Toledo, and already a contract has been awarded for the construction of a big sewer in the southern part of the city, costing about $22,000. This same concern has been given the contract for the construction of a sewer disposal plant.

The Northern Brick Company was recently incorporated with a capital stock of $12,000, by John R. Boice, Warren Boice, James Hodge, William H. Tucker, and Erskine H. Potter. The new company will take over the plant of the Boice Brothers in East Toledo. The plant will be enlarged and the capacity will be doubled.

Henry Simmons, of Chicago street, is building a new brick and tile plant out Michigan avenue, about two miles beyond the city limits. The machinery is now being placed and the plant will be set in operation in the near future.

It is reported that the farmers north of Bowling Green, Ohio, are forming a company for the purpose of erecting a plant for the manufacture of brick and tile.

The Toledo Coal and Coke Company, and the Fremont Coal and Mining Company have consolidated under the new name of the Toledo Coal and Clay Company, which is incorporated with $350,000 capital stock. The new concern will manufacture brick, tile, coke, iron and other mineral products, to mine coal, and drill for oil or gas. The incorporators are Andrew P. Mackie, Charles J. Hart, Charles S. Craver, H. C. Adams and C. F. Phillips.

The Smith Brick Company, at Sandusky, O., at a recent meeting decided to go into the sand-lime-pressed-brick business. The capital stock has been increased to $35,000. The company has been reorganized, the new stockholders being George Feick, John Home Gardner, Jr., Jacob Kuebler, Lorenz Zorbach, J. P. Webber, August Wiedman, Louis Seiler, E. H. Marsh, E. P. Brohl and Herman Appel. The charter members of the original company are G. W. Doerzback, Edward Welsh, Michael Walsh, John H. Smith, and Ernest Stevens.

C. G. Ziegler, formerly of the Ziegler Filter and Pottery Company, and John E. T. Nicks, of Toledo, are forming a company for the purpose of manufacturing an improved water filter. Mr. Ziegler has been in the filter business actively for ten years, and is thoroughly acquainted with every detail of the work, while Mr. Nicks has been for a number of years a dealer in brick machinery and also interested in the manufacture of brick. Mr. Nicks has invented an automatic attachment to be used in connection with the Ziegler gravity filter. The patents will be on both the automatic attachment as well as on the general construction of the filter. The company will be incorporated within a short time and organized. The men are now seeking a location for a plant. Plans are under way for the manufacture of large filters for house and public buildings. Filters of all sizes made in proportion to the needs of either residences or public buildings will be manufactured. The automatic attachment will combat the influence of pressure from city water works, and when the filter is once filled with pure water the automatic attachment shuts off the supply. The new concern will be known as the Ziegler-Nicks Company and has already opened offices at No. 230 Nasby building.

The Toledo Railway and Terminal Company is extensively advertising Toledo in the April issues of the most important magazines in the ountry. Toledo is shown up as the most advantageous point for the location of manufacturing plants. The company is advertising "Free Factory Sites." It is expected that the proposition will attract to the city those interested in potteries and the manufacturing of sand-lime brick, there being great deposits in this section to warrant such locations.

The estate of the late Major E. B. Hall inventories $51,867.14, according to the appraisement in probate court, filed recently. Of this amount $37,000 represents the value of the realty.

T. O. D.

From Beyond the Rockies.

Editor CLAY-WORKER:

Gentlemen—I wish to advise you that my sons and myself have started up for ourselves at Twenty-fourth street and Corbett road, so in the future that will be our address. I have opened up one of the best banks of clay in the West, have finished my first Hoffman kiln, burning with oil. Please mention this in THE CLAY-WORKER, so that my old friends will know where I am. I am using one of E. M. Freese & Co.'s automatic cutting machines, the out-put has to be 70,000 a day, when the weather clears up. I enclose you my subscription for the coming year and wishing you success. R. SOUTH.

San Francisco, Cal.

WARM THE BRICKS.

How Building Goes on Merrily in Winnipeg During Zero Weather.

The large amount of building which is going on here this winter astonishes visitors who cannot understand how bricks can be laid satisfactorily with the thermometer far below zero, says a Winnipeg, Canada, special to the New York Sun. Winter building is going on faster than at any other time. In fact, it is contended that mortar frozen before it is dry is better than that which is not frozen.

The bricks are laid upon a sheet of iron, which is heated by a fire built underneath. The heat from the fire percolates through the bricks slowly, and as they are heated they are removed for use.

The mortar is heated in the same way by ground fires, but has to be handled more expeditiously than the brick, for it might be of an unequal temperature.

"I supposed," one of the builder's workmen was told, "that you did not do any work out of doors when it was cold."

"Yes, replied the man. "We worked right along when it was 20 degrees below zero."

"But it was 30 below, one day last week, was it not?"

"I remember," said the carpenter; "worked that day, too."

"Weren't you cold?"

"Oh, no. We don't mind it. You see, the walls shelter us from what wind there is, and when it is very cold there is generally no wind. Besides," he added, "a man feels like work then."

Several of the masons said that they had no trouble in laying brick in this way in cold weather, and that the work was better than that done on warm days.

From the Faraway Transvaal.

Editor CLAY-WORKER:

Dear Sir—You will note my change of address. I came here a short time ago to act as engineer and fireman.

The fire brick plant here has been in existence seven or eight years and has a reputation second to none out here for fire goods. This concern recently changed hands and under the title Vereeniging Brick and Tile Company, limited, it is intended to manufacture a full line of clay goods generally. We are at present busy erecting the sewer pipe plant—all English made machinery, of course—pipe pressed to make up to 18-inch pipes, which we hope to have at work very shortly. We shall also make buff brick and terra cotta at the same plant, then erect another plant for the production of red brick, etc.

The brick trade out here seems to have been overdone. In all directions both hand and machinery yards are standing in all quarters. Even at this time a decent brick is something of a novelty.

The labor question out here is causing some little trouble, as no doubt you will have read, but it seems to affect the mines chiefly, as we do not have any difficulty in getting what labor we require.

The conditions under which the natives engage make it rather awkward and they are constantly on the move seeking pastures new.

I have had THE CLAY-WORKER sent on here since I left home, but please send direct here, care Brick and Tile Company.

With best wishes for a successful season, I remain, sincerely, JAS. WM. SCHOFIELD.

Vereeniging, Transvaal.

A FINE RECORD.

The Scott Manufacturing Company, Keokuk, Iowa, report that they have sold their seventh plant, thus keeping up the precedent they have established of selling all their machinery before it is finished.

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING NEWS.

THE CITY has just passed through an election which is expected to greatly assist in the development of its public works, along the lines of economy to the taxpayers and of benefit to the paving and building contractors. Taking the ideas advanced by one of the most wide-awake brickmen in the city, it is apparent that there will be less boodle and more work done in the next couple of years. He says: "From what I know about the men who will have charge of the letting of work for which special taxes are assessed, and what I am told about the others, I feel confident that there will be a clean letting, and the man who will furnish the best material and work for the money will get the business. Some of these men are not thoroughly versed upon the qualities of brick, and other material, but they are men who will learn, and a good many of them are well posted on values. This is an exceptionally good state of affairs for the city, the taxpayers, and also the contractors, for where there is nothing but a fair field for all there will be a fair profit and work which will be good enough to bring more business. The trouble with the most of the members of boards of public works is the fact that they know nothing of the values of the materials submitted to them, coming from some line of business which has had nothing to do with the handling of building material."

The representative of The Clay-Worker has been especially interested in this city election, from the fact that the winning ticket, Republican, was led to success by Walter S. Dickey, of the Walter S. Dickey Clay Manufacturing Co., who was chairman of the central committee, and is deserving of the highest praise for leading his party to such a general success as it has not experienced here for years.

The total of the building permits taken out in this city during the past month was $1,033,580, there being 388 permits issued. The same month of last year showed building permits of $1,325,000, but that included one permit for the Metropolitan Street Railway power house which amounted to $300,000. This year the permits for the month of March were almost all for residence property, and over half of the total amount is for brick buildings, including flats and cottages.

Contractors are very busy at this time, figuring on the building which is still in embryo, and all join in declaring that this is going to be the banner building year for the city, far exceeding the building operations of last year, which were handicapped by the flood. They now say that the postponed building of last year will just be added to what would otherwise be the regular amount of building for this year.

Several large manufacturing plants are being figured upon, and four or five large elevators, besides a 1,500-barrel flour mill, and the new refinerv of the Standard Oil Co.

This new refinery is going to have a great effect upon the future of Kansas City. The plant is to cover a 120 acre plot, near the city, on the Missouri river, and will have a pipe line from the Kansas oil fields. The buildings are not let by contract, but are being built by the construction department of the Standard Oil Co., and they will place their contracts for brick direct with the manufacutrers. They are figuring with a number of the large manufacturers in the Kansas gas fields, and will probably place their orders with factories on the Santa Fe road, as their plant is located on that line.

The location of the refinery here is going to cut a considerable figure in the manufacturing business, and the arrival of crude oil through the pipe line will probably mean the doing away with coal fires in a great many of the furnaces and power plants, and the substitution of oil as a fuel.

The price of paving brick remains at about the same figures quoted a month ago, with a tendency towards an increase in the price of common brick, as the demand for them continues to increase. Quotations are: Common salmon, $6 per M.; red and hard, $7; select reds, 2¼ inches thick, $11; vitrified, $13; first quality red pressed brick, $16; second quality, $13; semi-vitrified, $18; chocolate, $20; granite, $20; buff, $23; grey, $24.

The sewer contract which had been advertised for El Dorado, Kas., was not let, on account of all the bids for pipe being several thousand dollars above the limit set. The contract will be readvertised.

Information is expected from Guthrie, Okla., in regard to a sewer letting at that point, within a very few days.

The Pittsburg Brick Company reports the sale of another million brick to the Texas Oil Company, to go to their refinery in Port Arthur, Texas, as the refinery is to be built larger than originally intended.

The Kansas City Hydraulic Presesd Brick Company reports that a proposition is now under contemplation by them, towards putting in oil as a fuel in their different plants, to burn their brick, instead of using coal.

Shinnick & Massman have just installed some new machinery in their plant, which will assist them in improving the quality of their product.

The Pittsburg Brick Company is now manufacturing a fine pressed brick at the new plant in Sycamore, Kansas, and are meeting with great success in both the manufacture and sale of brick from this new plant. The color of the brick is beautiful, and the texture is said to be unsurpassed.

The Kansas City Hydraulic Pressed Brick Company has secured the contract for furnishing the brick for the new extension to the Government building in this city, which covers 1,500,000 common brick, 80,000 hollow brick, and all the grey pressed brick required for the building.

The Pittsburg Brick Company, which already has the reputation of being one of the most up-to-date brick companies in the West, has decided to add steam shovels to its already complete plants, and the first steam shovel, which is to go to the Pittsburg plant about the middle of this month, will be installed with the expectations of putting in similar machinery at both the Sycamore and Leavenworth plants as soon as its value is established at Pittsburg. This company is putting in a number of new kilns in its Sycamore plant also.

Brick manufacturers say that there is a great deal more building of substantial brick buildings in the smaller cities and towns surrounding this city than there has been for years, and while this condition holds good in Missouri, Kansas and Oklahoma, it is especially noticeable in Kansas and Oklahoma.

A. R. Mense has secured the contract for the only piece of brick paving let lately in this city, at $1.95 per square yard.

On March 30, the mayor of Shawnee, Okla., laid the first paving brick ever put down in the city. A good deal of the concrete work had already been put down, and there has been something like $500,000 worth of paving contracted for in the city, to be completed as sooon as possible.

A brick roadway, 22 feet wide, is to be built to connect Atchison, Kas., with the Orphans' Home, near that city. The contract for making the road, out of penitentiary made brick, was let to McGuire & Stanton, of Leavenworth, for $21,700.

During 1903 between 5,000,000 and 6,000,000 brick were used in Brownsville, Tex., and vicinity, and the price of brick has advanced from $3, Mexican money, per thousand, to $3 to $4 in United States currency.

C. W. Carman has sold out his brick manufacturing business in Hamburg, Iowa, to F. Johnson.

Isaac S. Edmondson has succeeded to the entire brick manufacturing business of Edmondson & Rogers, in Kalona, Iowa.

The death is reported of U. R. Harvey, of the tile manufacturing firm of U. R. Harvey & Son, in Martinsburg, Ia.

The Diamond Brick Company, of Ellsworth, Wash., is making extensive improvements, and adding a tile factory which will employ seventy-five men, and for which orders are already reported on hand which will keep the plant running through the summer.

F. A. Parker.

Written for The Clay-Worker.

THE CLAY INDUSTRIES AT THE FALLS CITY.

THE CLAYWORKERS OF LOUISVILLE and vicinity are figuratively rolling up their sleeves and getting ready to make the fur fly just as soon as the weather man gets good.

At the down town office of the P. Bannon Sewer Pipe Company, 510 West Jefferson street, there is an air of pleasant anticipation. Business is yet quiet, only a little being done in sewer pipe line this early in the season, but the busy time is right on hand and it looks like there is going to be plenty doing this year. The outlook is good in brick, not only in vitrified pavers, but also in fire and building brick. There is a strike on locally that is temporarily tying up the work here in Louisville, but it is felt that it is only temporary, and, anyway, it hasn't much weight on the general brick trade with them as a large part of their business is out of town. This company has a fine display of their wares in the down town office, and especially so of the sewer pipe, which they make in all sizes up to 30 inches.

Mr. J. W. A. Myers, of West Point, Ky., reports over long distance telephone that he is getting his brick yard in shape for the season's run. He is adding some new machinery and refitting all around, putting things in nice shape generally for a busy time, and he thinks he will have it, for the outlook is bright now, all that is apparently wanted is a little dry weather and sunshine to start things humming.

The down town office of the Burrell & Walker Sewer Pipe Company looks like business, too, and in addition to sewer pipe, tiling, etc., on display, they have a supply of barrelled fire clay coming in and going out that makes one think he is in the produce shipping section.

While nosing around a feed store the other day for odd things in the way of side line I came across a side product of the John Bauer Pottery Works, of 2122 Preston street, Louisville, that interested me and put me to wondering about the possibilities of side lines in clay working. It was only some little drinking fountains for poultry, not so much in themselves, but they suggested things, possibilities. Then I went out to see the pottery works. Mrs. Susan T. Bauer is the owner, Mr. A. C. Gardner manager and C. Heinz office man. Mr. Heinz said they were now getting busy in their work, stocking up for the spring trade, which gets lively about next month. They make almost everything you could think of in the pottery and stoneware line from a two-inch flower pot to a big meat tub, and have an especially extensive trade in the south on flower pots and jugs; also on fruit jars. The present outlook, they think, means an excellent year, and if business holds up to the present indications they will enlarge the works after this season's rush is over. They get their stoneware clay from Huntingburg, Ind. A. Colonel.

THE BALTIMORE FIRE.

Modern Terra Cotta Fire Proofing Fully Vindicated.

By Frank Brown.

A few days after the great Baltimore fire I visited that city and made a thorough examination of the fire-proof qualities of the following buildings located within the range of the recent Baltimore fire.

Brown's Bank.
National Union Bank.
International Trust Company.
Calvert Building.
Continental Trust Building.
Equitable Building.
Union Trust Building.
Maryland Trust Building.

The first three above mentioned buildings are single story height and were used only for banking purposes, but all the others are what are commonly called sky-scrapers, the highest being the Continental Trust Building, being sixteen stories in height.

Referring to the fireproof floor construction, the long span tile arch did not seem to fare as well as the short span tile arch of a span up to six feet.

The Equitable Building which was constructed of long span tile arches, the thickness of the arch at the crown was not sufficient to stand the slight shocks from partitions, plastering, etc., falling on same and they were broken through in a number of instances, and the steel work being thus exposed suffered in a great measure from twisting and distortion in the heat.

It is my opinion that the fire proof covering on the bottom of the beams, which in most cases is one inch in thickness, should have been at least two or two and one-half inches, as some of this slab covering was entirely destroyed and the beams in other instances suffered greatly from the effects of the fire.

Regarding material of the floorings, it seems that the cement floor is the only kind that was not disturbed. The marble and tile floors are all disintegrated and practically destroyed, I presume by the expansion of the material and the consequent resting of the tile on the cement bed.

The wooden floors throughout all buildings were entirely burned away, including floor strips which were embedded in concrete, leaving a well-defined groove or furrow in the concrete where they were once embedded.

None of the partition work in the buildings seemed to be exactly what was required for perfect fireproof construction, as the tile partitions were about one-half knocked over, presumably by the terrific draught, or possibly by the doors banging back and forth in the draught until the partition collapsed. As a result of this agitation, the plastering in most of the buildings does not seem to have been as fireproof a material as was commonly supposed, as in almost every case the walls were entirely stripped of plastering and where the debris fell on the floor it was entirely reduced to fine powder. This was also the case in the partitions which were constructed of expanded metal and plastering. The latter did not seem to have the slightest fire-resisting qualities.

The fire-proofing around columns where the same was constructed in the ordinary manner of tile three or four inches in thickness, was in nearly every instance found to be intact. I would suggest that such work in the future be thoroughly clamped together and not too much dependence placed on the cement in which the tile is laid.

Marble wainscoting and marble columns suffered greatly and cannot be considered fire-proof in the least. This may also be said of granite, marble and limestone trimmings for exterior walls, as in every instance where there was the slightest heat trimmings spalled off, so that the entire work in this line in every building will have to be replaced.

The roof construction where the same consisted of brick or tile roof was not in the least damaged, but on one or two buildings that had composition roofs I noticed several damaged places and attributed the result entirely to the non-fireproof qualities of the latter kind of roof.

I also noticed that great damage resulted from the melting down of the solder joints and skylights which allowed the glass to drop through and which afforded easy access to combustible material in the building.

The cast iron stringers, railings and elevator fronts, cast iron trimmings of all kinds did not seem to be damaged anywhere to speak of. The best results seemed to have been in the Brown Bank Building, where the outside windows were fitted with galvanized iron frames and sash and glazed with fire glass. The glass was broken in every window, but the wire held it intact and prevented the entrance of the fire, except where something heavy fell against same from the outside and took the sash with it. This allowed the fire to enter at one corner of the building and considerable damage was done at that point.

In conclusion the above results would indicate that the best fire-proof building possible to build is one composed of a steel frame structure thoroughly covered with terra cotta arches, with the above alterations, brick walls and either brick or terra cotta trimmings and cement floors.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Burning Tile With Brick.

Editor CLAY-WORKER:

In your March issue, J. A. Foglesong asks for information as to how to set tile with brick in an up-draft kiln. Having burned tile in this manner for a number of years with success, my experience may be of some benefit to him.

We used an up-draft kiln with furnace attached, kiln being 16 feet wide. We set the arches with brick in the usual way, nine courses straight, four overhangers and binder and six courses of brick over the arch, making twenty courses in all up to the tile. We did not put on any brick on top of tile except three courses of burnt platting. We set large tile at bottom, setting 6-inch in 8-inch, 4-inch in 6-inch, 5-inch in 7-inch and 3-inch in 5-inch, then on top courses set all 3-in. or the smallest tile you make. We put one course of platting about one inch apart, the other two courses tight, this prevents the heat from escaping too freely, the tile giving a very strong draft, platting should be opened up until water-smoke is off and fire begins to show, when it should be closed tightly. We always found the brick burned under tile in this manner to be of superior quality as they were all hard and uniform owing to the fact that the strong draft of the tile prevented to a large extent the over-heating of the arches.

Shreveport, La. ELIAS PETTS.

Busy Winter in North Dakota.

DEAR MR. RANDALL:

Yours of the 14th ult. is before me. I am sorry I could not be with you to partake of the good things which the proceedings of the N. B. M. A. are always made of. Enclosed find $3.00 for N. B. M. A. and $2.00 for subscription to THE CLAY-WORKER.

I had hoped to be at the convention and show my wire rope delivery system which we are using on all the yards here and at Winnepeg, but I took a contract to build a press-room 25x60 for the Daily Herald Company, which had to be done quick, this requiring the laying of brick in February with the thermometer 20 degrees below zero. This was done by heating the sand very hot and using hot slacking lime with a little cement mixed in just before the mortar is used. I find this makes a good wall—as good as if laid in summer, in fact, better than a wall built in summer where the brick are not wet before being laid.

I see I have drifted from the subject, but write the above to show you that we do not hole up in winter like a bear.

THE CLAY-WORKER came last night. I took a look at the pictures and found brother Sam's. I am anxious to get at the reading. Many of the faces are familiar, and now I wish to get better acquainted with you all by reading the proceedings.

Business was only good last season. We closed down in August, but later sold four million brick at Winnipeg to the Manitoba Construction Company and others. We look for a good season this year.

Wishing you and your good book every success, I am pleased to remain,

Yours truly,

Grand Forks, N. D. W. P. ALSIP.

Success of the Sand-Lime Process.

Editor CLAY-WORKER:

We note an article on Sand-Lime Brick in the March issue of THE CLAY-WORKER, on page 369, signed by "F. H." This article stated that 'H. Huennekes & Co. are the only firm in this line that have made and are making a commercial success of this business."

We submit that this is very unjust to your other advertisers, and very far from the truth, and we are much surprised that you should allow a statement of this kind to appear in your paper. As for ourselves we would say that we are making such a commercial success of our American process that we have in operation and in course of construction at the present time twelve of these plants in different parts of the country, the purchasers of which carefully investigated all the other systems as well as our own before contracting with us. A number of the German systems are also making a distinct commercial success in this country, and the statement in your paper is manifestly unfair to all of us who are developing the sand-lime brick industry in America on a strictly business basis. We are not asking royalties, nor selling territory rights or gold brick, but are guaranteeing results at our own expense.

Kindly publish this letter in the next issue of THE CLAY-WORKER in justice to ouselves and the other advertisers.

AMERICAN SAND-LIME BRICK CO.

Chicago, April 8, 1904.

ST. LOUIS BRICK AND BUILDING NEWS.

Editor CLAY-WORKER:

Brick and terra cotta industries are very quiet just now. While the report of the building commissioner shows that there is a marked increase in the number of building permits, most of them just now are for frame buildings, in connection with the World's Fair. The result is, that the demand for brick is quite small and comparatively few are being used.

Then, too, there is hardly a day passes but some trouble with labor arises. If one request is granted, another is asked for, and the result is a continuous controversy between labor and employes is always going on.

More building and altering was done in St. Louis during the month of March, just closed, than was done in March, 1903. More money was spent on the work of last year, however, the cost of buildings erected in March, 1903, having exceeded the cost this year by $407,086.

Last month 111 brick houses were built at a cost of $925,175. Two hundred and forty-seven frame houses were erected at a cost of 468,073. Brick houses altered numbered 145 and cost $214,052, while 77 frames were altered at a cost of $9,913, totaling $1,617,813, against a total of $2,024,899 for March last year.

Three hundred and fifty-eight brick and frame structures were erected last month, against 234 in March 1903.

Prices have not changed. Merchantable brick is still quoted at $7.50, strictly hard and red at $8.25, ordinary hard and red at $8, front red and stock at $18, and sidewalk and paving at $10.

Since January 1 the Building Commissioner's office has issued permits for temporary World's Fair structures worth over half a million dollars.

The total value of the buildings which consist largely of hotels, stores, pavilions, cafes, saloons, restaurants, storehouses, stations, power houses, and Pike concessions, is $539,490.

Nearly $230,000 of that amount is being expended in the erection of temporary hotel buildings on various sites within easy reach of the Fair. The largest is the Christian Endeavor Hotel, which is to cost $98,000.

A company has been organized in Mexico, Mo., for the manufacture of vitrified paving blocks and building bricks. The capital stock is $50,000 and is half paid. A committee has gone East to buy machinery.

The new plant of the White Hall (Ill.) Tile Works, was opened a couple of weeks ago. The plant was burned several months ago, and the company has been engaged in the construction of a new plant at a cost of nearly a quarter of a million dollars. The formal opening was celebrated with a banquet by the stockholders and officers.

The Evens and Howard Fire Clay Company have recently been granted a permit by the county court to open a road leading from their clay mines near Glencoe, in St. Louis county.

Plans have been prepared for a large plant at East Alton, Ill., for the manufacture of sand-lime brick for building purposes. Deposits of fine sand in that vicinity attracted the owners of the new plant headed by E. E. Squire of this city.

The Aetna Fire Clay Company, of St. Louis, recently secured letters of incorporation, with a capital stock of $10,000, one-half paid. The purpose of the company is stated to be, to mine and mill clay. The incorporators are: George J. Berresheim, Leopold Berresheim, Agnes Berresheim and Henry Kaune.

W. H. Walton, of Burslum, England, who will be the representative of an English pottery manufacturing company, is in the city.

William B. Ittner, commissioner of school buildings of the Board of Education, left March 26, for Madrid, Spain, to attend the international congress of architects, which was to convene in that city, April 6. Mr. Ittner prepared a paper on "Recent School Architecture in St. Louis," which has been translated into French, in which language the business of the convention will be conducted. He also has a number of photographs of St. Louis school buildings to exhibit at the meetings.

The failure, a few weeks ago, of certain contractors to file bids for the construction of a number of Belleville, Ill., streets, that were to have been paved with asphaltum, has resulted in their being paved with brick.

The Oak Hill Fire Clay Company, of this city, has been incorporated with a capital stock of $20,000.

The Clinton, Mo., pottery was destroyed by fire on the morning of April 10. The fire originated in the boiler-room. Fifty men were thrown out of work. The plant was owned by P. A. Folckmer of Kansas City, but negotiations were pending to merge it into an association backed by Chicago and Cincinnati capital. Its rebuilding is considered doubtful. A. SAINT.

Written for THE CLAY-WORKER.

COLUMBUS, OHIO, BRICK AND BUILDING NEWS.

ALL KINDS of building operations, brick and otherwise, were practically at at standstill here during the winter, owing to the extreme inclemency of the weather. There was considerable building under course of construction, but little could be accomplished against the onslaughts of the Storm King, except where the structure was under roof. There are at this time, however, quite a number of fine brick buildings which are nearing completion, which were well under way before the cold weather came. As a result of the dullness in the building trades, there was a corresponding lull in the brick market, and as one manufacturer said: "The sales were few and far between." There is an optimistic unanimity among the manufacturers, however, who state that the outlook for the spring and summer trade is very flattering. While the number of building permits, as yet, have not been large, it can be stated with reasonable certainty that at least three or four skyscrapers from twelve to fifteen stories and requiring thousands of dollars' worth of brick will be under course of construction this summer or before the close of the ensuing year, besides many other lesser structures under contemplation.

The Columbus Contractors' Supply Company is a new organization recently effected for the purpose of manufacturing and placing on the market a high-grade quality of building brick. The company now controls plants of which the aggregate output is twenty millions of brick yearly. Besides handling brick, the company acts as a selling agency for other materials, such as lime, cement and sand. The officers of the company are D. W. McGrath, president; Frank Hunter, general manager, and R. L. Watson, manager of sales department.

The Franklin Brick Company, a new concern located on the B. & O. and Panhandle railroads, a few miles east of Columbus, is building a fine new plant which will be ready for operation about April 1. The company has leased a tract of land comprising about 66 acres and containing a high grade quality of Bedford shale. The company is owned and controlled by Columbus capital, and when the plant is completed it will have a capacity of 100,000 brick daily.

The present prices of brick here range from $6.50 to $7.50 per thousand. A good quality of building brick can be obtained for $7.00.

Last season Columbus contractors experienced considerable difficulty in obtaining enough brick and material without some exasperating delays. This year, however, they think that the supply will be adequate, as local plants have large quantities on hand which were manufactured during the winter season.

The Forest City Clay Works of Forest, Hardin county, has increased its capital of stock from $5,000 to $12,000.

A new concern recently incorporated is the Oak Harbor China Company of Oak Harbor. The incorporators are W. J. Harvey, Fred Storm, Albert E. Davis, Henry Gormbacker and Charles P. Salen.

The American Sewer Pipe Works just north of this city, which has been closed down for some time, has been leased and will be converted into a brick manufactory.

Mr. Kilbourne of the Columbus Brick and Terra Cotta Company, informs THE CLAY-WORKER representative that the company's plants at Union Furnace, Ohio, run in full all winter. He states that he anticipated a brisk spring trade and that their supply is sufficient to fill all orders.

Since the organization of the Columbus Contractors' Supply Company, the newspapers here have been teeming with predictions of such sharp competition that it would be sure to force down the prices of brick. Until the advent of the former company into the field, the market was virtually controlled by the Union Brick and Supply Company. In contradiction of the newspaper reports, Mr. Frank Hunter, general manager of the Columbus Contractors' Supply Company, said to THE CLAY-WORKER representative, "When we organized the concern we went to brick manufacturers and secured a number of their contracts for the sale of their entire output. The prices will be what every manufacturer charges. We do not seek to monopolize or cut prices. We are not organized for the purpose of competition, but rather to build up a large business not only in Columbus, but in surrounding towns."

An immense new brick plant is soon to be erected in Portsmouth, Ohio. At the head of the company is Levi D. York and Dudley B. Hutchins. The Peebles Paving Brick Company of the same city, will also build a twin plant adjoining its present building.

Everything seems to be serene between Columbus brick contractors and the trade unions. In outlining their position, a prominent labor leader who is also a well-known local brick mason, said to THE CLAY-WORKER representative: "It has been said that the scale of prices of the brick and stone masons here is exorbitant and out of proportion to the prices received by the contractors for their work; that the prices of material and labor have gone up, but the employers are compelled to accept the same prices for their work as when labor and building material were cheaper. In reply, I wish to state that to a certain extent this is so; however, if the brick contractors do not receive a price sufficient to allow them a neat profit, it is their own fault. Living expenses have increased so in the past few years that the salary of the average mechanic is barely sufficient to allow him and his family a comfortable living. Now, what's to prevent the contractors from getting together and agreeing on a rate of fixed prices, or something of the sort? This does not only apply to the brick contractors, but other trades as well. There is no excuse for a contractor not making money if he knows his business. If organization will aid you, why, Mr. Contractor, organize! We'll meet you half way." CARLISLE.

NOTES FROM TIDE WATER, VA.

MR. C. B. CHASE of Suffolk, Va., is now general manager of the Charlotte, N. C., Brick Company, located at Fort Mills, S. C. In a recent letter from him he says they are turning out 50,000 Chambers end-cut brick and 20,000 dry press brick per day, and cannot keep up with their orders. Mr. Chase has recently worked out an automatic cutting table which he is having patented and one that will be a leader. Mr. Chase is a practical brickmaker and the Charlotte Brick Company are to be congratulated on getting such a man at the head of their plant.

Mr. Wm. Radford, the English continuous kiln builder, who has been general manager of the Standard Brick Company of Norfolk, Va., for the past year, has resigned his position and will devote his time in the interest of his different styles of continuous and down-draft kilns. He is also getting out a new machine for stiff mud brick which will do away entirely with lamination.

E. W. Face & Son of Norfolk, Va., have added several tunnels to their Sharer dryer, which will greatly increase their output.

The Suffolk Clay Company is putting in four Chambers' 14-arch coal burning kilns and will do away with the old style wood burning kilns.

Mr. F. G. Thompson of Elizabeth City, N. C., has worked out his clay in the old plant and has bought a new tract of land on which he will build a new and modern plant. Mr. Thompson visited me a few days ago with samples of clay and test brick which were very fine and he is confident of a great success in his new plant. He is in the market for new machinery.

Mr. Flake G. Steele of the firm of J. C. Steele & Sons, Statesville, N. C., visited this section a few days ago in the interest of his company. They have a great many machines in this section which are giving perfect satisfaction and becoming more popular every year.

Mr. Charles Parker, of Franklin, Va., has accepted a posi tion as superintendent of the West End Brick Company, of Suffolk, Va. They use the J. C. Steele machinery and make about 10,000 per day. They are now in the market for a dryer of 25,000 daily capacity.

The Norfolk Builders' Supply Company are preparing for a busy season at their brick plant. They have a very neat little plant located in Brambletree Ward, Norfolk, and use the Steele & Sons' end-cut machinery. Mr. L. W. Doyle is general manager and he is up-to-date. On a visit to their plant we were shown around by Mr. Doyle and saw some very fine burns.

Suffolk, Va., April 8, 1904. H. L. J.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

NOTWITHSTANDING the good building outlook, the brick trade has been rather quiet throughout California so far this year. The principal cause of this is the prolonged rains which have prevailed for the past two months. Beginning with April 1st the weather has improved greatly and contractors expect the demand for brick to improve from now on. The value of the building permits compares very favorably with the value of those issued a year ago and architects report that a large figuring is being done. The outlook is therefore good, and brick manufacturers and contractors are anxious for the rainy season to close.

The Seymore R. Church Company has been incorporated here with a capital stock of $25,000. The directors and shareholders are Seymore R. Church, L. F. Fawre, K. C. Schmidt, J. S. Hutchinson, Jr., and P. B. Roberts. Mr. Church, the head of the new company, was formerly a prominent dealer in fire brick in this city and it is understood that the new company will continue in this line.

Wilson-Lyon & Co of SanFrancisco, have purchased machinery for a new brick factory which is to be located one mile north of Point Richmond, the San Francisco terminus of the Santa Fe Railroad. The capacity of the plant will be 2,000,000 bricks per day and about 100 men will be employed. Building bricks and vitrified paving bricks will be turned out from the clay beds, adjacent to the factory, which are claimed to be of superior quality. Each machine in the plant will be directly connected with an electric motor.

The Sonoma Brick Company has been incorporated to engage in California with a capital stock of $25,000. The incorporators are R. S. Levy, Leo Kaufmann, L. Lacher, E. W. Choynski, and B. F. Flasher. The principal office of the company will be in San Francisco.

The plant of the Southern California Brick Company at Los Angeles, California, was damaged by fire on March 17th, to the extent of $1,100. This loss was fully covered by insurance.

The brick war in Los Angeles over the contracts for the construction of the outfall sewer at that place is still in progress. Joseph Simons, president of the Simons Brick Company, is threatening to apply for an injunction to prevent the construction of the sewer as now planned. The contract for the brick to be used in the sewer was let to C. Forrester for $6.40 per thousand, a price considerably below the ruling price of Los Angeles. The latest from the seat of war is that the city engineer who reserved extensive rights in the matter of the construction of the storm drain, will insruct the contractor to use vitrified pipe in place of brick in construction of the sewer.

The Sunset Brick and Tile Manufacturing Company of Santa Monica, California, will shortly complete four new kilns at the brick yard. Each kiln will cost about $4,000 and will have a capacity of 100,000 bricks. The big kilns are lined with fire brick and arrangements have been made to use the same heat for burning the brick and for drying the green brick in the dry house. Twenty tunnels for conveying the heat of air are now being built. The construction of the plant requires about one-half million bricks. The walls of the flues or tunnels are 110 feet long by 7¾ feet high. The managers of the plants are now making experiments in the manufacture of sewer pipe and tiles. It is expected that the new additions and improvements when completed will bring the factory to a point where it represents an investment of $75,000. On the afternoon of March 24, an explosion occurred in the engine room, completely wrecking that portion of the plant and buried under the wreckage Engineer Chas. E. Thomas. Mr. Thomas was severely injured but is recovering. The only cause assigned for the explosion is the ignition of gas arising from the petroleum which is used as fuel.

F. A. Curtis of San Jose, California, has been awarded a contract to furnish common brick, pressed brick, terra cotta, tiles, lime and cement for the new David-Jacks Theater at San Jose, for $7,050.

Ed Mowery, a brick man of Ferndale, California, has invented a ventilating brick on which he will endeavor to secure a patent. The bricks which Mr. Mowery proposes to manufacture, will be 8 inches thick, 10 inches deep and 16 inches lnog. These will be perforated by two holes 3 inches square.

J. F. Garrett of Garrett Bros., brickmakers of North Yakima, Washington, was in Prosser, Washington, last week making arrangements to open a brick yard at that place. The firm will put in a plant with a daily capacity of 20,000 bricks. Both brick and tile making machines will be installed. The new plant at Prosser will be under the management of Harry Garrett.

The Blue Mountain Lumber and Manufacturing Company of Asotin, Washington, has purchased the Asotin Brick Yard, formerly owned by Caywood Bros. and will, during the coming spring, burn a kiln containing about 250,000 bricks. Julius Krumira will be superintendent of the plant.

P. H. Cone of Hamilton, Montana, is now in Lewiston, Idaho, where he will at once begin manufacturing bricks.

C. A. Woolfolk is preparing to start a brick yard at South Bend, Washington, and is now investigating that vicinity for the purpose of securing a suitable deposit of clay.

J. F. Brown and F. E. Brown, who have been engaged in a brick business at Hanford, California, under the firm name of Brown & Brown, have admitted J. H. Johnson in partnership and will continue business under the name of the Hanford Brick Company. They have purchased a brick press, and will, hereafter, manufacture pressed brick as well as ordinary building brick. This year they will burn several kilns at Lemoore, California.

C. C. Padgett, an experienced brickmaker, is at present in Tacoma, Wash., for the purpose of establishing a brick yard for the manufacture of pressed brick, fire brick and building brick.

James O'Doane has leased a large tract of land in Fallon, Nevada, for the purpose of establishing a brick yard.

A. L. Brown, acting as receiver for the Great Northern Clay Company, of Seattle Wash., has sold the company's brickyard and property to the Carstens Bros., wholesale butchers of Seattle, for $18,700. Carstens Bros. will conduct the brickyard themselves, using the product largely in the construction of their new packing house at Tacoma.

L. J. Brannan, proprietor af the Ashland Brick Yards, at Ashland, Ore., has installed a new brickmaking machine, with a daily capacity of 20,000 bricks.

L. D. Macy of Chico, Cal., has decided to establish a brick yard at that place which will have a daily capacity of between 25,000 and 50,000 brick. Machinery for the plant has been ordered in San Francisco and oil will be used as fuel.

There is a movement on foot among local capitalists for the establishment of a brick and drain tile manufacturing plant in Ferndale, Cal. Sunset.

San Francisco, April 5, 1904.

For cheap machinery the reader is referred to our "For Sale" columns. We do not advise the purchase of cheap machinery. As a rule, cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted," "For Sale," etc., columns a means of satisfying their needs.

THE CLAY-WORKER

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A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

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☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

VOL. XLI. APRIL, 1904. No. 4.

CURRENT COMMENT.

There may be a building boom in St. Louis after the Fair—to house all the people who will be stranded there.

* * *

There is room in this world for more than one kind of brick. Any way we must make room for new arrivals when they prove their worth.

* * *

Press ever onward, or we fall back. Life's fierce competition permits no standing still. The potters of England are proving that fact now.

* * *

However simple the process of sand-lime brickmaking appears, it may perhaps be found that with it the chemist is more continually needed than on the burned clay brick plant.

* * *

Labor in France is less exigent than with us. The first of this month a law came into operation prohibiting women and children working in factories more than ten hours a day. The men work twelve hours.

* * *

Contingents from many parts of the earth are streaming St. Louis-wards. Now is the time to examine the branches of the family tree—with a microscope if necessary—and see what cousins live in the World's Fair city.

* * *

Much has been said about the Baltimore fire. That the first-class sky scrapers stood the test in a satisfactory manner has been quite thoroughly demonstrated. The statement by Mr. Frank Brown on a preceding page has the merit of thoroughness and brevity, and we commend it to the attention of our readers. Mr. Brown speaks from personal observation, having gone to Baltimore for the express purpose of noting the effect of the fire upon the fireproof buildings. It is quite evident that the construction of a fireproof building is after all a question of insulation. The skeptical public may scout the idea that buildings can be made really fireproof, but Mr. Brown's observations prove that the Continental Trust Building and other similar structures are to all intent and purpose fireproof.

OHIO CLAY EXHIBIT AT WORLD'S FAIR.

The Ohio exhibit of clay mining industries has been forwarded from Columbus, in charge of Mr. Ogden, assistant to State Geologist, Edward Orton, of the Ohio State University, to the World's Fair grounds at St. Louis, and will be mounted soon. There are over two car loads of exhibits, comprising delicate and costly ware, sewer pipe and huge blocks of coal. The exhibit includes the largest section of sewer pipe ever made, which was turned out by a Toronto plant.

Charts accompany the exhibit, showing the position of Ohio as a clay manufacturing State. They will show that this State makes over one-half of the total pottery product manufactured in the United States, more than one-half of the whiteware, nearly all the chemical and art ware and a third of the yellow and Rockingham ware.

WHAT IS PROPER FIRE INSULATION.

At a recent meeting of the National Board of Underwriters the question of fireproofing was thoroughly and carefully discussed, and while the matter has not yet been definitely formulated, it would appear that an insulation of three inches of fireproofing material is the minimum of insulation necessary for thorough fireproofing. One inch of this insulation as contemplated may be air space, but it is folly to provide less than two inches of insulation, three-fourths of an inch of which is air space. Such fireproofing is insufficient. No matter what the material may be—hollow tile or anything else—and no matter how it may be applied, structural metal cannot be insulated so it will stand the destructive action of great heat with less than three inches of fireproofing. Municipal authorities should bear this in mind for the building ordinances of many large cities are weak and inadequate in this connection. There is much need of reform in this direction. Every city should adopt the Underwriters' standard requiring an insulation of three inches of fireproofing around all metal work.

THE WORLD'S FAIR OPENING.

If all goes well, as well as things have gone up to the present, the first of the great spectacle illustrating triumphant American progress, will commence within a few days from now. The labors of those who promoted the exposition and are carrying it to grandest completion will meet their reward. These, of course, have been the men, from President Francis and Secretary Steves downwards. Those, too, who have helped from afar will rejoice to see the fruition of their efforts, chief among these have been the members of the press of every branch, not last among them being the thousands of trade journals throughout the world. The general head of the publicity department, Mark Bennitt, and his colleague, W. A. Kelsoe, in charge of the local press, have secured an amount of free advertising that, charged up at regular rates, would probably amount to some millions of dollars. In doing their work they have combined the adroitness of a Machiavelli with the generalshipness of a Napoleon. We do not begrudge our own contribution and look for our share of the reward in the glorious success of the greatest enterprise of its kind that the world has ever seen.

The first act in the great spectacle is the opening day, but the show will not be quite complete then. These things never are. Not even in Paris where expositions are a habit and a tradition, but any incompleteness will be no fault of the authorities. The buildings are all ready to receive exhibits. Delays are due to the dilatoriness of exhibitors and the unfortunate idea held by so many of them that, "It won't be ready for another month or so." Of course it will not be ready if exhibitors are governed by that feeling.

In our own section in the Mines and Metallurgy building the exhibits are coming in fairly well. The Tiffany pavilion of enameled brick is nearly complete and the imposing structure of the Hydraulic Press Brick Company is about three parts finished. The clay exhibits in the Palace of Manufactures, so for as can be now seen, are not numerous, but they will attract attention. A very ornate pavilion, the work of the Winkle Terra Cotta Company of St. Louis, is finished; opposite this is the structure about 15 feet wide and 34 feet deep, of the Evans & Howard Fire Brick Company, St. Louis. This is built of fire brick of splendid quality and appearance. A row of columns support one side of the building, these are formed of glazed stoneware sewer pipe two feet in diameter. Next to this is the exhibit of a kindred industry, the Mississippi Glass Company, which will be an extensive one. On the opposite side of the building the exhibit of the Laclede Fire Brick Company, St. Louis, rises forty feet in the air. It consists of two, regular size, gas making furnaces. These were all the exhibits that were discoverable upon our visit a few days ago, but a great number of others will appear before the opening day.

HOOSIER PROGRESS.

Plans and specifications are now being drawn for the Standard Brick Manufacturing Company for the purpose of reconstructing and modernizing their plant on the west side at Evansville, Ind. The improvements contemplated include the installation of an immense steam dryer, a new machinery house and a fan house, the buildings to be of brick and fire proof, and completed by early spring. Workmen are now engaged tearing down and removing the long rows of racks and pallets heretofore used in drying the brick. When finished Mr. Kleymeyer, the general manager, says it will be the most up-to-date brick plant in this section of country and will be in steady operation through the year independent of the weather conditions, increasing the capacity of the plant from about 4,000,000 brick to 9,000,000 annually. The new machinery equipment will be arranged so that the company can begin the manufacture of dry press brick or stiff mud brick as soon as the demand for them in the local market will justify the same. Mr. H. C. Kleymeyer states that the quality of the brick turned out at the new plant will be far superior to any made thus far, as the large deposit of shale on their property will now be gone into and used instead of surface clay. Another large kiln will be erected at the Washington avenue plant of this company the coming season, and the drying capacity increased by one-third, giving a total annual capacity of 18,000,000 brick, or almost twice the number sold in Evansville by all of the manufacturers last year. The plans for the improvements are being designed bv W. D. Richardson, Columbus, Ohio, who has charge of the work of construction.

FOREIGN BUSINESS.

There is food for thought for the clayworker in the happenings at Panama. The significance of this happening is greater than any of us realize. It is more than our relations to a bit of territory, it means more than the early building of a great canal. It illustrates a spirit and policy on the part of this country which is greater than these. For over a hundred years we have been advancing upon our own frontier. Now, we have no frontiers of our own to take up, and naturally, instinctively, and to many of us unconsciously, we are reaching out. Our relation to Cuba is stronger than many of us know. We dominate Porto rico as we do the Philippines and Hawaii. Alaska was the result of our first great reaching out and now we have one foot on Panama. All this means extension of trade. It means new business. It means a firmer establishment of our material prosperity. It means not alone those of us who are clayworkers will sell certain clay products and much clayworking machinery in these countries but that we will sell brick and other clay products and much clayworking machinery to people here at home who are made more prosperous and wealthy by selling cotton goods, cereals and other products of the land and machinery to the new countries to which we are relating ourselves. An extra sack of flour sold in Panama or the Philippines or Porto Rico may mean an extra brick or two made in Kalamazoo. We cannot look at the world through a pin hole. The Panama incident is another ripple created by a pebble we have cast into the commercial sea.

A NEW BUILDING ORDINANCE FOR INDIANAPOLIS.

In some respects the methods pursued in formulating the new building ordinance for Indianapolis are worthy of emulation. It takes into consideration all of the practical conditions which surround the preparation of such documents. A meeting was called by the Building Inspector of the city addressed to the leading architects who, by request, appointed a Comimttee of Ways and Means. This committee advised the formation of a final committee for the purpose of formulating a building ordinance, the committee to consist of the City Building Inspector and the Chief Fire Engineer to represent the city administration, the City Attorney, to represent the legal department, a member of the City Council to represent the legislative department, a member of the Bureau of Inspection of the Board of Underwriters, one builder from the Contractors' Association, a member of the Builders' Exchange, three architects and the State Factory Inspector. All this was done, and while it might appear that this organization is somewhat ponderous, that has not proven a serious defect. The committee has met one evening each week, the city provided a stenographer, and a report of each meeting was written and submitted in full at the next session. The various building laws and building documents were used as a form and guidance in the mapping out of the work. Every member of the committee has taken an active interest, and it is confidently anticipated that the result of their labors will be a model building law. The full text of the same will be submitted to our readers in a subsequent issue.

TRADE LITERATURE.

OHIO GALVANIZING AND MFG. CO., Niles, Ohio, has recently issued a neat little catalogue descriptive of their pressed steel brick pallets and other similar articles, of which they manufacture a large variety. Their "Ohio" pressed steel brick pallets have special features, of which they will be pleased to tell our readers who will address them on the subject.

"THE SHARER DRYER" is the title of a very neat little catalogue received from the Sharer Dryer and Kiln Company, Philadelphia, Pa. The title is a fine piece of designing and the illustrations will interest every brick and tile manufacturer, for every clayworker is interested in the economical drying of his ware. Students of this problem are invited to correspond with the S. D. & K. Co., who are located at 914 Walnut street.

THE WILLIAMS PATENT CRUSHER AND PULVERIZER CO., St. Louis, Mo., has favored us with a copy of their "Testimonial" catalogue. The name is well chosen for the book contains nearly 400 testimonial letters from satisfied users of Williams machinery. It is a remarkable showing, and proves conclusively that the Williams crushers and pulverizers are adapted to almost every nameable material. Many of the letters are highly complimentary, fully as much so as that of ex-President Eisenhart's published on page 475 of this issue. CLAY-WORKER readers can obtain a copy for the asking.

THE C. W. RAYMOND CO., Dayton, Ohio, is sending out an exquisitely executed four-page leaflet, illustrating and describing their new automatic cutting table, and Niagara hollow ware and fire-proofing machine. The illustrations which are really works of art and much resemble lithographs are pasted on the leaflet, which is a buff deckle edge egg-shell paper. The printing is in a rich shade of brown, which makes a beautiful contrast. They are enclosed in envelopes of the same paper, and the entire scheme is so rich that it is sure to impress the receiver favorably, and that is good advertising.

BECHTEL BROS., Waterloo, Ont., are sending out a unique little leaflet or folder, which demonstrates that the Bechtel system for hacking, trucking and drying brick is worth looking into, for it is claimed that it cuts from $5 to $25 a day from the labor bills of those using it. Those who want to "look into it" will please write for a copy.

THE JEFFREY MFG. CO., Columbus, Ohio, who make a specialty of all manner of conveying machinery, has issued a leaflet devoted especially to the Jeffrey Crab Bucket, which is adapted to the handling of all sorts of minerals, including gravel, clay, and soft earth of any nature. They will gladly mail a copy of it to any of our readers who will send them their address.

"ON THE WITNESS STAND" is the title of a pretty monograph received from the C. W. Raymond Company, Dayton, O., and is devoted chiefly to testimonial letters from users of Raymond brick and tile machinery, dry pans, etc. They will gladly send this and other interesting publications of a similar character to any readers of THE CLAY-WORKER who will write them.

THE THEW AUTOMATIC SHOVEL CO., Lorain, O., has out a new catalogue of their steam shovels, excavators and dredges. The cover is rather sombre, being a very dark gray, with title in black and red. The interior decorations consist of a large number of handsome half-tone plates illustrating their various styles of shovels as they appear in operation. Those of our readers who are interested in such matters are requested to write the T. A. S. Co. for a copy.

THE MAN WORTH WHILE.

It is easy enough to be pleasant,
When life flows by like a song;
But the man worth while
Is the one who will smile
When everything goes wrong.
For the test of heart is trouble,
And it always comes with years,
And the smile that is worth
The praises of earth
Is the smile that shines through tears.
DUNN.

"BUSTED."

We thought we hed th' very clay,
T' make 'em high priced brick,
An' hed a expert out one day,
Punch 'roun' thar 'ith his stick;
But "No" an' 'ith his stick he rapped,
Said "Marl cud not be trusted,
An' ef we did we'd more than apt,
Jest like th' bricks—go busted.

But Gol! we thought we knowed th' most,
An' one ol' lone machine,
Wuz jest about all we cud boast,
Beside a truck an' screen;
We started an' in part th' groun',
Some hard an' whitish crusted,
Lumps, uv somethin' else we foun',
An Blame! th' darn bricks busted.

But we kep' on an' burned a kiln,
An' cleaned up things about,
An' w'en th' fires hed long been still
Clum' up an' tuk some out;
But Gosh! an' Gol Darn Holy Smoke!
Gol Darn! thet ol' press rusted,
Darnation, Say! yer Uncle's broke,
By Hang! th' bricks wuz busted!
Houston, Tex. —ZELLARD E. BUELL.

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IMPROPERLY DESIGNED, or ill-adapted, Drier or Kiln Plans are dear as a gift. The very best design for your conditions and purposes can be had at a moderate price.

WILLARD D. RICHARDSON,
Brickworks Engineer.

See page 539 and 549.

WANTED, FOR SALE, ETC.

FOR SALE OR TRADE—A complete brickyard; capacity 25,000 per day. For particulars, address, WM. BORREY,
1 tf d Fairmount, Ind.

FOR SALE—Second hand typewriter—$100.00 machine as good as new. Price $60.00, sent subject to approval. Guaranteed by the manufacturers. Nothing better on the market.
Address J. A. S.,
4 1 d ? Care Clay-Worker.

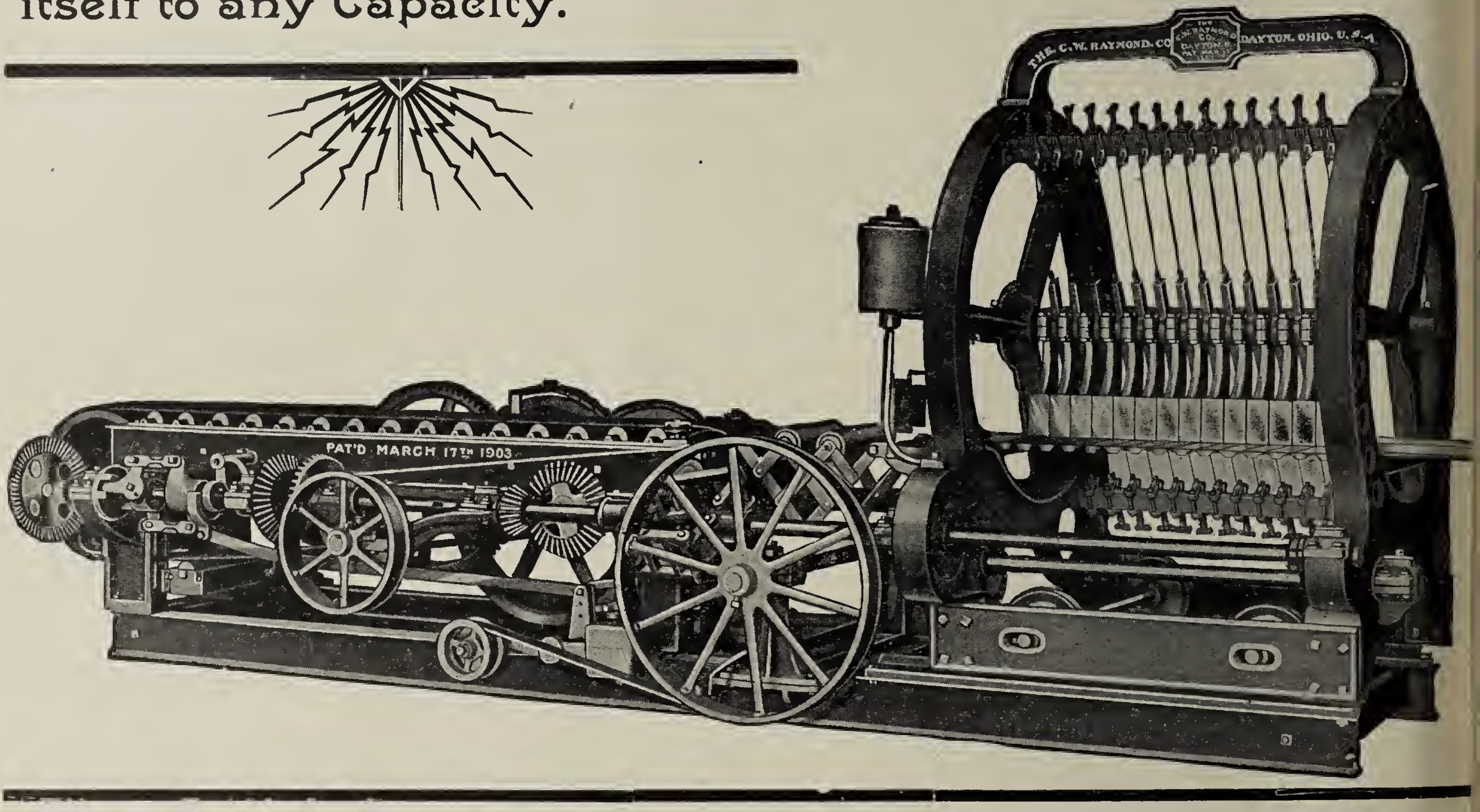
FOR SALE—One Atlas right-hand throttling governor engine, 100 h.p., suitable for brickyard work. In good condition and cheap to a quick buyer. For price and particulars address
Bolivar Foundry and Machine Co.,
2 2 dm Bolivar, Pa.

FOR SALE—Sewer pipe plant now doing a prosperous business. Abundance of good clay and a well-equipped factory. The death of the proprietor makes sale desirable. An excellent opportunity to get a valuable property cheap. For full particulars, address
STONEWARE PIPE.
4 1 d ? Care Clay-Worker.

For Sale, Wanted, Etc., Ads Continued on Pages 538 and 539.

YOU CAN MAKE GOOD BRICK

just as cheaply as poor ones, and get more for them. Isn't it a business proposition, therefore, to equip your plant with machinery that will make the **Good Ones**? It costs no more and the results are tenfold better. This Cutter has a down shear cut. Cuts true to line and leaves no feather edges. It has a continuous rotary motion and regulates itself to any Capacity.



The RAYMOND AUTOMATIC CUTTING TABLE

THE C. W. RAYMOND CO., DAYTON, OHIO, U.S.A

BOSTON, MASS., July 24, 1903.

THE C. W. RAYMOND CO., Dayton, Ohio.

Gentlemen :—We are pleased to state that the Automatic Side Cutting Machine which yo installed at our plant at Dover Point is a success. We are no doubt making brick of a cla which is difficult to manipulate. It will not bear great pressure without distortion.

The first cutter we used was driven by the clay bar itself, and swelled the bar very badl out of size and shape so that the bricks were delivered with great variation as to length an height. With your cutter, however, which is driven positively from the Brick Machine itsel the speed being regulated by the governor to correspond with the travel of the clay bar, all o these difficulties have disappeared and we are getting a perfectly square and even size brick cut true to line, and we can moreover use the clay in a very soft condition.

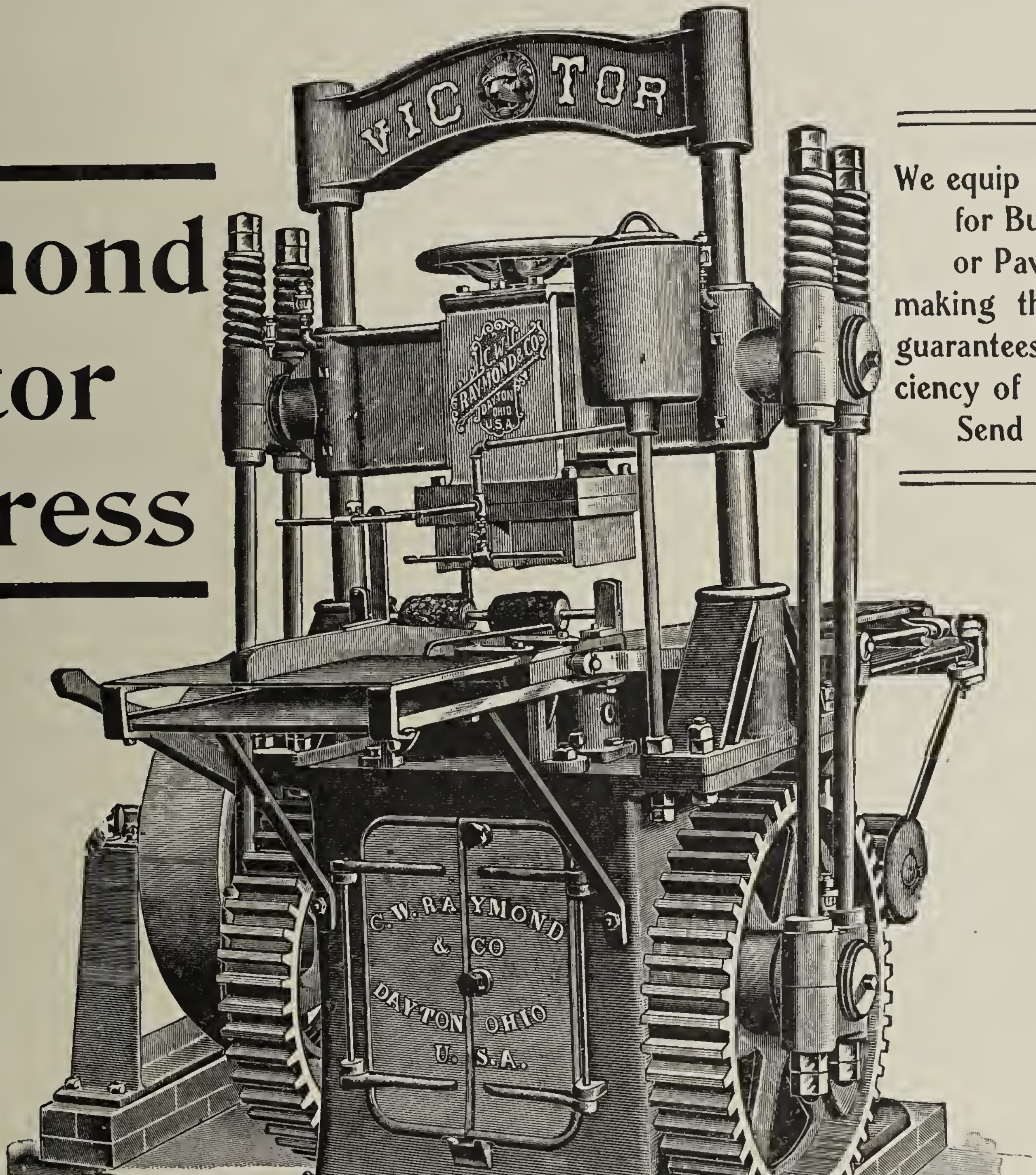
Altogether, we can heartily recommend your cutter to any one desiring to make a first class wire-cut face brick.

Very truly yours, THE FISKE BRICK CO.

THE VICTOR RE-PRESS

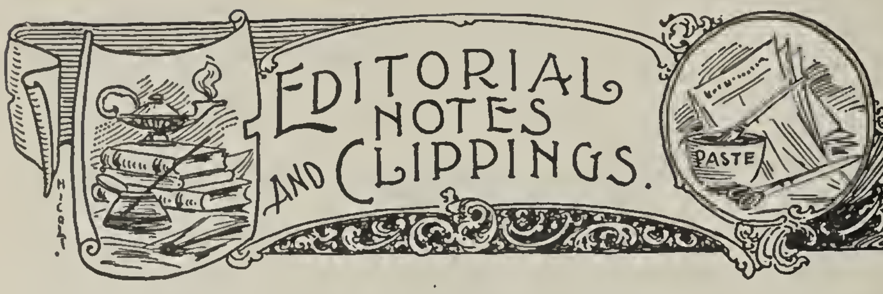
Do You Re-press your Brick? Do you give them the smooth surfaces, the square corners, and keen edges necessary to make a high-class brick? Do you recognize the worth as an advertisement, of your distinguishing imprint upon each brick? All these advantages can only be had by re-pressing. Re-pressing enhances not only the beauty of the brick, but their utility and sale value. The Victor has attained an unequaled distinction and had a phenomenal sale for this class of work. Its advantages and conveniences are so manifold, as to place it in a class by itself. The first machine that meets your eye on a well-equipped brick plant, is a VICTOR RE-PRESS. IT IS A MONEY MAKER AND A MONEY SAVER

Raymond Victor Re-Press


VIC TOR
C.W. RAYMOND & CO. DAYTON OHIO U.S.A.
C. W. RAYMOND & CO DAYTON OHIO U. S.A.
THE BROWN-BIERCE C° DAYTON, O.

We equip plants complete for Building, Fire or Paving Brick making the most liberal guarantees as to the efficiency of our machinery. Send for Catalog

THE C. W. RAYMOND CO., DAYTON, OHIO. U. S. A. NEW YORK OFFICE 39—41 Cortlandt Street, Room 40



Towner, N. D., is to have a new brick plant.

Frank Krause will start a brickyard at Cedar Bluffs, Neb.

A. W. Miles will enlarge his brick yard at Livingston, Mont.

The Wyoming Pressed Brick Company of Laramie, Wyo., is constructing an immense new brickmaking plant.

W. H. Simons contemplates establishing a brick plant at Escondido, California.

The Keim Brick and Tile Company of Louisville, Ohio, has been incorporated with $25,000 capital stock.

The firm name of Gunther & Son, brick manufacturers of Port Washington, Wis., has been changed to Gunther Bros.

The Potee Brick Company has been organized at Brooklyn, Md., with $12,000 capital. Peter Potee is at the head of the concern.

The Rose Brick Company has been incorporated at Portland, Maine, with M. W. Baldwin, president and A. H. Goddard, treasurer.

A new concern recently organized at Robinsonville, Miss., is the Robinsonville Brick and Tile Company. They have $10,000 capital stock.

The Bonham (Texas) Pressed Brick Company has filed an amendment to its charter, changing its name to the Steger Sand-Lime Brick Company.

McDonald & McGinitie have purchased land at Neligh, Neb., on which they are erecting a first-class brick plant of 40,000 capacity per day.

Andrew Walton, Jr., son of A. W. Walton of Princeton, Ill., was killed April 8th by being drawn into the machinery at the brick and tile plant of his father.

Noah M. Cofran, a retired brick manufacturer, died at his home in Cambridge, Mass., aged seventy-one years. He had lived in Cambridge most of his life.

The Ross-Keller Triple Pressure Brick Machine Company of St. Louis, Mo., have just completed a four-mold plant for the Kingsland Brick Company, Kingsland, N. J.

The Bradford Terra Cotta Company of Bradford, Pa., are installing a Raymond outfit of machinery for the manufacture of brick and tile in their plant at Lewis Run, Pa.

The Bolen Brick Company of Marion, Indiana, has been incorporated by Robert Spencer, and Edward and Viola J. Bolen, with $20,000 capital stock. They will manufacture both brick and tile.

Fred Clevenger is establishing a brick plant at Rushville, Ind., which will be equipped throughout with machinery from the shops of Madden & Co., and have a daily capacity of 50,000 soft mud brick.

The Eastern Brick Company at Baltimore, Md., with a proposed capital stock of $10,000, has been incorporated by Louis F. Deitz, Bruner R. Anderson, Cloyd Lewis, Karl A. M. Scholtz and Samuel Bealmear.

The Altoona Brick, Sand and Stone Company has been organized at Altoona, Pa., by Jacob F. Hirsch, W. E. Miller, S. Isenberg and others. The company is capitalized at $30,000. Sand-lime brick only will be made.

The brick manufacturing firm of Rankin Bros., Clarinda, Iowa, has been succeeded by the Shenandoah Brick and Tile Works, which has been incorporated by O. T. and F. B. Rankin, T. H. and E. A. Read, H. T. Shurtz and others.

The brick plant of John A. Schmitt's Sons of Wilkesbarre, Pa., which was burnt recently, is being rebuilt. The plant will be equipped with the best of machinery and appliances and when completed will be one of the best plants in the State.

The Chicago Brick Machinery Company are sending out the following notice: "About the 20th of April we shall move our offices from our present location at No. 225 Dearborn street, Chicago, Ill., where we have been since 1896, to the Great Northern Building at the corner of Dearborn street and Jackson boulevard, entrance at No. 77 Jackson Boulevard. This is only a block from our present location. We shall have a nice suite of rooms and all brickmakers visiting Chicago will be heartily welcome in our new quarters."

The Matthews (Ind.) Brick Company's plant has been purchased by Clifton & Sons, Peru, Ind., and is being put in working order by the new owners.

The Milton (Iowa) Brick Company has been organized by H. G. Poe, W. S. Campbell, E. O. Syphers and D. T. Hagler. The latter will be general manager.

The Pope Clay Product Company has been organized to develop the kaolin deposits at Aiken, S. C. Jno. C. Mosser and Jno. M. Murphy, both of Harrisburg, Pa., are interested.

W. Judson Smith has discovered a fine deposit of clay at Syracuse., N. Y., which he has had tested successfully for dry press brick. He will probably organize a company to develop the clay.

The Big Savage Fire Brick Company has just started up their immense new plant at Frostburg, Md. The plant has cost close to $100,000 and is complete in every detail. D. Armstrong is president, D. A. Benson secretary and treasurer and J. N. Benson general manager.

The Lewisville Brick and Mercantile Company has been incorporated at Lewisville, New Brunswick, by G. C., A. H., T. C. and M. B. Jones, and Wm. H. Cummins, with $24,000. The company will erect a plant for the manufacture of brick and will conduct a mercantile business.

W. L. Jones of Suffolk, Va., is building a new brick plant at that place. He is putting in a J. D. Fate & Co. "Hummer" brick machine. Mr. Jones would like to correspond with parties capable of taking the superintendency of this new plant which will have a capacity of 20,000 stiff mud brick a day.

A new brick manufacturing concern under the name of David L. Garber & Son has leased the Lenhart plant at Maytown, Pa. For some years this plant has not been operated regularly, but it is the intention of the new firm to improve it in many ways. They will make both paving and building brick.

The Great Western Brick, Tile and Pottery Company of Boulder, Colo., has been reorganized by electing R. B. Sigafoos president, T. L. Preston vice-president and W. A. Brockway treasurer. This company has just completed a contract for over 1,000,000 white face brick for a new Chicago skyscraper.

The Red River Valley Brick Company has taken out new incorporation papers and will hereafter be known as the Red River Valley Brick Corporation. They have purchased the four brick plants at Grand Forks, N. D., and will do a general manufacturing and sales business, including all lines of building material.

The Michigan Vitrified Brick Company, which recently purchased the Pierce Dry Pressed brick plant at Bay City, Mich, will at once begin the erection of a modern paving brick plant. They have had their clay tested with very gratifying results and expect to be turning out a first-class paving brick within sixty days.

R. C. Remmey & Son of Philadelphia are installing a complete Raymond outfit of Auger machinery in their works, consisting of auger machine and cutter of 30,000 per day capacity, large pug mill, disintegrator and Victor repress. This outfit was placed through the eastern agency of the C. W. Raymond Co., at 39 Cortlandt street, New York City.

Mr. Robert Goodwin of Redfield, Iowa, has just received word through his attorneys, Orwig & Lane of Des Moines, Iowa, to the effect that the United States Patent Office has formally allowed his application for a patent on a steam drying and heating system for brick and tile factories. Mr. Goodwin has issued a neat catalog fully describing the system, which is free for the asking.

The Versailles Fire Brick and Clay Manufacturing Company at Versailles, Mo., of which H. B. Harmon for many years associated with American Clay-Working Machinery Co. as salesman, is vice-president., is building an up-to-date plant at Versailles, Mo. Mr. Harmon writes that he will have general charge of the works when completed and that it will be one of the best plants in that section.

The Red Star Brick Company, Corry, Pa., has purchased a new site across the city from their old location and are now moving their old equipment to the new yard. A great deal of new machinery will be added and the plant will soon be one of the best in that section. The officers of the company are A. J. Hazletine, president; M. J. Mecusker, vice-president, C. D. Crandall, secretary and treasurer, and J. E. Mecusker general manager. The latter gentleman is a thoroughly progressive brickmaker and

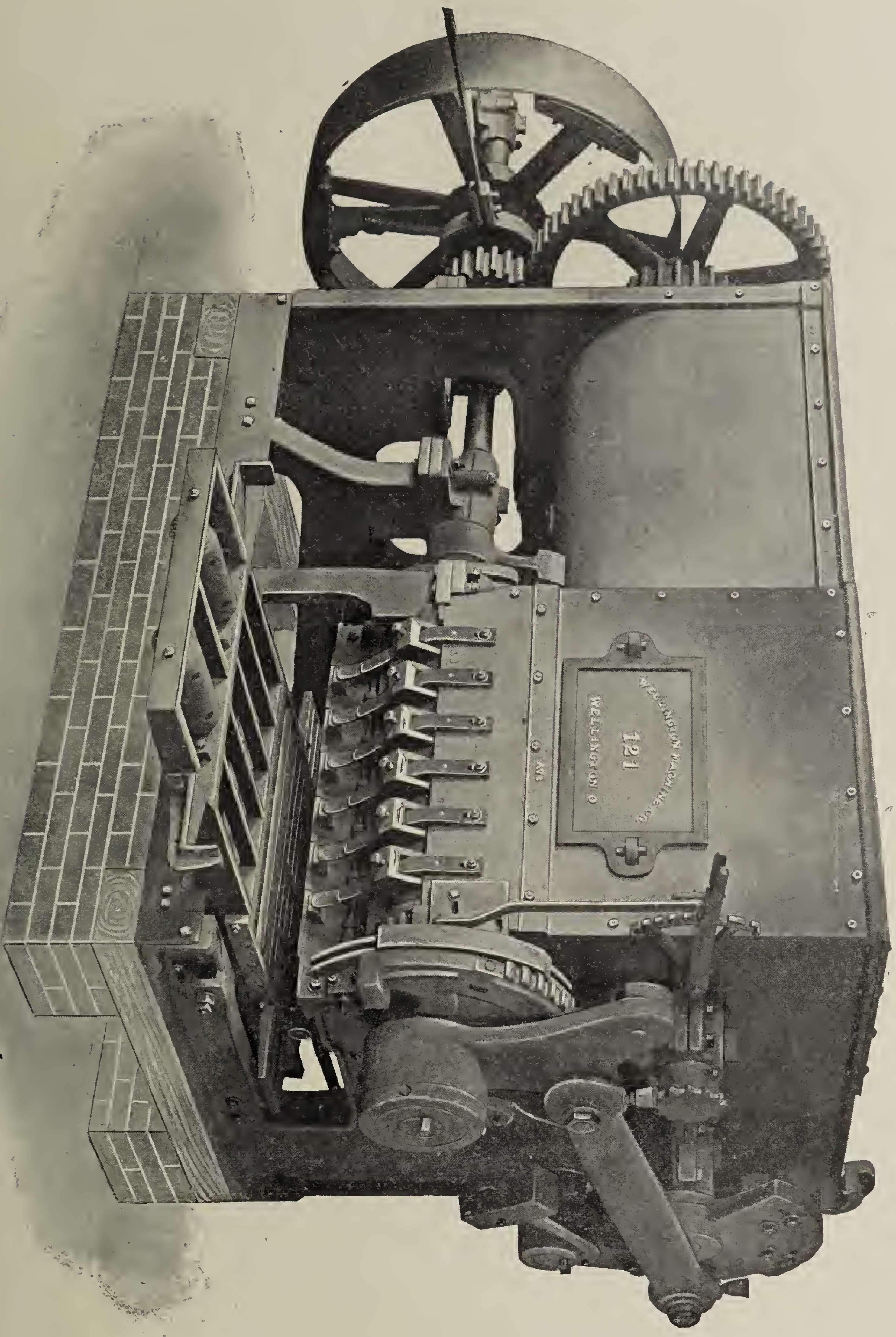
[CONTINUED ON PAGE 532.]

The "Big No. 6" "Monarch" Brick Machine.

OVER
175
"Monarch"
Brick
Machines
in use.

OVER
500
"Quaker"
Machines
in use.

WRITE
to us
regarding
Disintegrators,
Pug Mills,
Mould
Sanders,
Sand Dryers,
Smooth-roll
Crushers,
Moulds,
Barrows,
Trucks,
Winding
Drums,
Dump Carts,
Elevators,
Dump Tables
and all
kinds of
Kiln
Castings.



REMEMBER:
You are losing
money wheeling
brick unless you
have our
ROLLER-BEARING
BARROWS.

The Wellington Machine Co.,
WELLINGTON,
OHIO.

Send for Catalogue.

EDITORIAL NOTES AND CLIPPINGS—Continued.

will no doubt use to advantage in the erection of this plant some of the ideas picked up at the Cincinnati Convention last winter.

Tweedle & Hamilton, who recently purchased the brick plant of E. James at Fruitland, Ont., Canada, are making a number of improvements in same.

P. C. Bracker & Co. is the name of a new firm organized at Montevideo, Minn. They will at once erect a plant and hope to be turning out brick in a couple of months.

S. J. Allen of Parsons, Kansas, will establish a building and paving brick plant at Sedalia, Mo., where he has purchased a tract of land containing a splendid deposit of clay.

George Bruner of Streator, Ill., is erecting a large brick plant at Wichita, Kansas, which will have a capacity of 35,000 brick a day. He will make both building and paving brick.

Thomas Clarey, who had been employed as foreman by the New York Brick and Paving Company, Syracuse, N. Y., for the past eleven years, died April 6 of pneumonia. He had been ill but four days.

C. A. Whittlesy of Manson, Iowa, and C. Nelson of Barnesville, Minn., have purchased the brick plant of Evans & McClure, Lohrsville, Iowa. The plant has just recently been improved and is in better shape than ever before.

F. E. Swift, inventor of Swift's grateless slack coal coking table furnace kiln, writes that he has moved from Cincinnati to Dayton, Ohio, where he has purchased residence property, and will be located permanently at 420 W. Fourth street.

While assisting in moving some sheds at his brick yard at Malvern, Iowa, E. C. Stone was badly injured recently. By some mishap one of the sheds fell, and some of the timbers struck him breaking his neck and paralyzing almost his entire body.

The Wadsworth Brick and Tile Company has started work on their new brick plant at Wadsworth, Ohio. The plant will be equipped with machinery from the shops of E. M. Freese & Co., Galion, Ohio, and they hope to have it ready for operation by the first of June.

The Oklahoma Sand-Lime Brick Company has been organized at Oklahoma City, Okla., with a capital stock of $75,000. L. R. Curtis of Chicago, M. L. Blackwelder and Robert Chowning of Oklahoma City are interested. An up-to-date plant will be established at once.

The Piedmont Mercantile and Development Company, Piedmont, W. Va., is enlarging their works and will manufacture repress paving brick. They have recently purchased a Victor repress from the C. W. Raymond Company, Dayton, Ohio, through their Pittsburg office.

The Minneapolis Brick and Tile Company is the name of a new corporation that has acquired about 45 acres of clay land in north and northeast Minneapolis, Minn., and will become an important factor in developing this new and progressive industry. The new company has absorbed the Higgins Brick Co., located at 47th avenue and Lyndale, and will enlarge the plant.

J. C. Steele & Sons, manufacturers of "New South" brickmaking machinery, Statesville, N. C., report they are very busy and have received orders for thirty outfits of brick machinery during the first three months of this year. They recently sold four 25,000 daily capacity outfits in one day. They have been obliged to increase their force and consider prospects very bright.

The Ferris Paving Brick Company, Mechanicsville, N. Y., which has just been reorganized, is going ahead with its work this season with more zeal than ever. It is now under the management of Mr. F. H. Ferris and C. R. Sheffer, both of that city. Mr. Ralph Sharer the former manager of the works, is to return there the first of May and operations will begin for the season with full force to get out a number of large contracts the company have made. They have contracted with the C. W. Raymond Company of Dayton, Ohio, for a new "777" brick machine and rotary down cut automatic cutter which is now being installed.

Frederick S. Naugle, for the past thirteen years manager of the Onondaga Vitrified Brick Company's factory at Warner, N. Y., has resigned to accept a position with The Green Hunter Brick Company at Thurber, Texas, owned by the Pacific Coal Company, and will leave about April 15. Mr. Naugle has been a member of the National Brick Manufacturers' Association for a long time and has many friends throughout the country who will join with us in best wishes for his success in his new location. His associates at the Warner plant presented him with a fine gold watch which it is needless to say is highly prized by Mr. Naugle.

L. B. Stroud of Mabel, Minn., will probably start a brickyard at Steele, N. D.

J. W. Smith and E. P. Elliot of Chanute, Kansas, contemplate the erection of a brick plant at Wellington, Kansas.

The Dillehay Brick Company, Danville, Kentucky, has filed articles of incorporation. E. R. Dillehay is president, and Robert Dillehay secretary and treasurer of the concern.

The Rockwood Brick and Tiling Company of Roane county, with an authorized capital of $5,000, has been incorporated at Nashville, Tenn. The incorporators are M. F. Mullican, M. H. Phillips, E. B. Shadden, J. F. Register and F. C. Copeland.

The Enola (Pa.) Brick Company has been chartered. The incorporators are Thos. McDonald and Caleb S. Brinton, of Carlisle, and F. J. Newcomer, of Wormleysburg, Pa. A large plant will at once be erected for the manufacture of both brick and tile.

J. G. Huston and John Dodd of Mena, Ark., have just closed a deal with the Success Brick Machinery Company of Memphis, Tenn., for a complete outfit for a new brick plant they will erect at Mena, with a daily capacity of 50,000 brick. They will make their plant up-to-date in every particular.

W. P. Alsip, Grand Forks, N. D., writes that they are very busy getting their new plants at Winnipeg, Manitoba, in operation. They have just purchased two sand-mold outfits from C. & A. Potts & Co., Indianapolis. They expect the output of these plants combined with their two other plants now running will give them sixteen million brick this summer.

On or about the 20th of April, The American Sand-Lime Brick Company will move their offices from No. 225 Dearborn street, to the Great Northern Building, corner Jackson boulevard and Dearborn street, Chicago, Ill. They will have a line of sample brick made by their process on exhibition in their offices and all visitors will be given a cordial welcome.

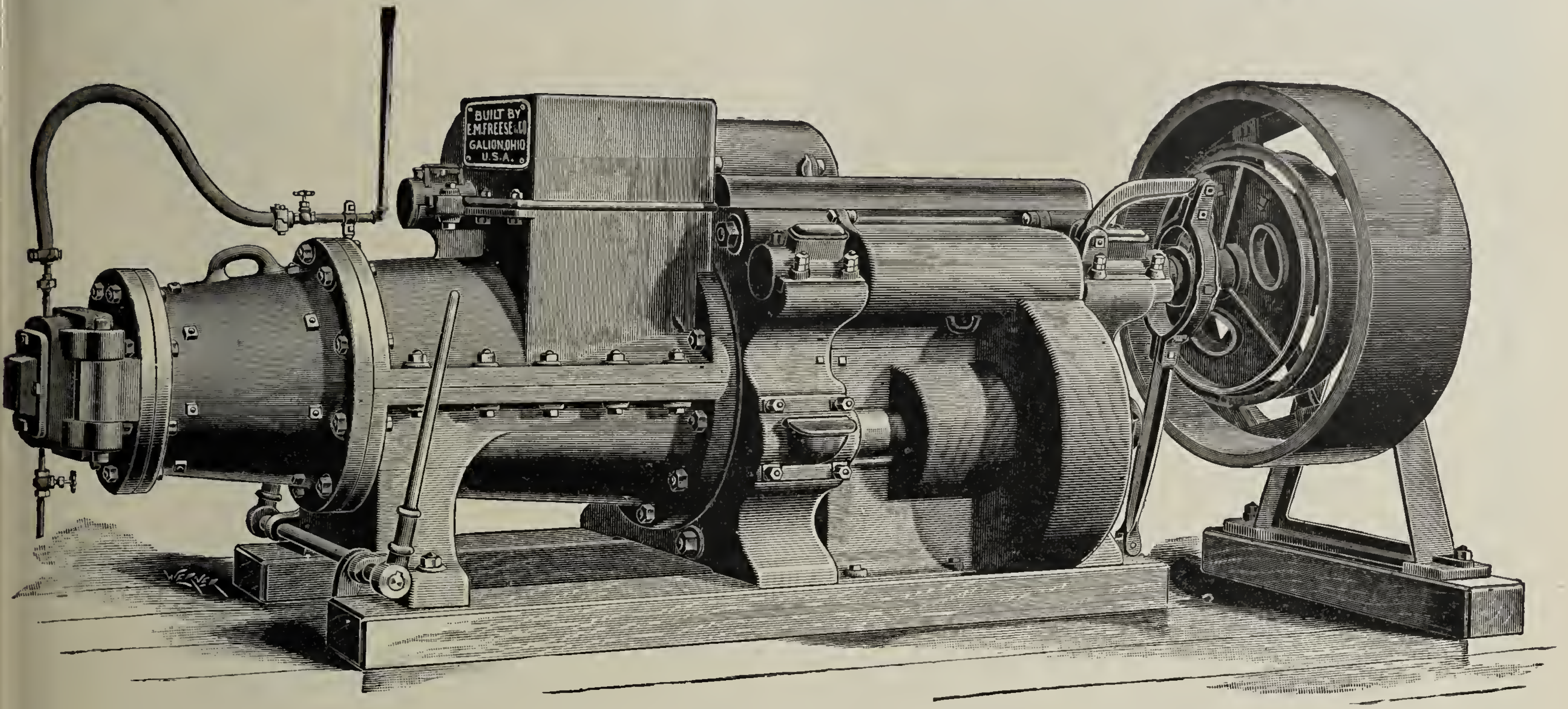
Mr. L. M. Hess, the well-known brickmaker of Millville, N. J., is installing a complete Raymond outfit of machinery consisting of No. 1 pug mill, No. 1 Daytonian brick machine and Triumph cutter. He is also placing a complete new power plant of Philadelphia make in the works which will have a daily capacity of 40,000 brick when running full. He will dry by the open shed and hacking system and burn in down-draft kilns, several new ones of which he is erecting.

The West End Brick Company, Suffolk, Va., heretofore a private concern, has been changed into a corporation. The principal office is in Nansemond county; the capital stock from $7,000 to $25,000. The objects of the company are to own and traffic in real estate and to manufacture brick, tiling and other products of clay. The officers of the corporation for the first year are: Thomas H. Birdsong, of Courtland, president; Henry L. Land, of Suffolk, vice-president; Charles Parker, of Franklin, general manager; John C. Holliday, of Suffolk, secretary and treasurer; the above, with M. H. Moore, of Franklin; G. Frank Birdsong, of Norfolk, and Frank A. Holladay, of Suffolk, directors.

The Wehrheim brick plant at Cayuga, Ind., has been sold to L. D. Boyd, of Delphi, and Mahlon Boyd, of Clayton. The new proprietors will do business under the name of the Acme Brick Works They are experienced brick and tile men and expect to put the plant in operation just as soon as it can be overhauled. The output of the works will be stiff mud building brick. A force of thirty or forty men will be used to commence operations and more will be put on the pay-roll as the business progresses. The company will sink a shaft in the near future and mine coal for its own use. W. T., and C. P. Boyd, of Clayton, Ind., sons of Mahlon Boyd, will have charge of the business.

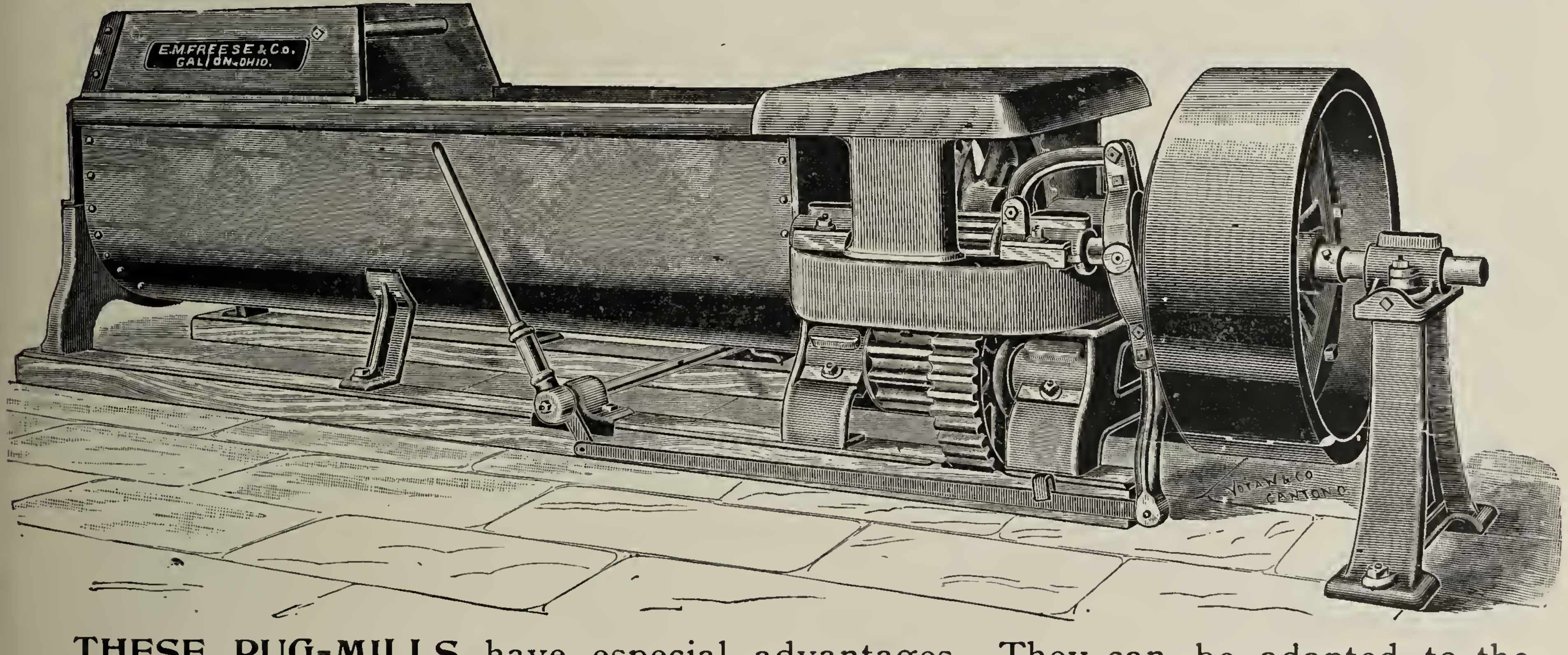
The new works of the Richmond Brick Company of Great Kills Creek, S. I., N. Y., is well under way. This will be one of the most modern brick plants in the country. The buildings are entirely of brick and steel, not a piece of wood being used in the entire construction of the plant. The machinery being installed is of Raymond make, consisting of two large clay separators, 12-foot pug mill, "999" brick machine with rotary automatic cutter, and Victor represses. The dryer and waste heat system is of improved pattern and is entirely the design of the Raymond Company. When completed it is expected to be a model plant of this type. It will have a total daily capacity of from 80,000 to 100,000 brick. The kilns will be of the down draft type and the plant is located on the water's edge where a spacious dock will enable them to load boats and ship right into New York and Brooklyn.

Our Mammoth Brick Machine



THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

Our Pug-Mills Have Features of Great Merit.



THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 574 and 575.

Written for THE CLAY-WORKER.

POTTERY NEWS.

ALL OF THE potteries of East Liverpool and vicinity are fairly busy and all of them seem to have quite a few orders ahead, although hardly any of them are rushed. On the whole, however, all seem to be pretty well satisfied and a successful year is looked forward to by all.

The Potters Mining and Milling Company of East Liverpool now have their new addition in entire operation.

The Sevres China Company of East Liverpool, are now operating a new set of decorating kilns, just completed.

The Goodwin Pottery Company of East Liverpool, have completed a small kiln which will be used for testing purposes.

It is reported that the Homer Laughlin China Company, a thirty-two kiln concern of East Liverpool, will go into the manufacture of vitrified hotel and thin china along with their regular line of semi-porcelain, and another plant may be completed for that purpose.

The New Lexington Sand Company of New Lexington, Ohio, will erect immediatelv a plant for grinding sand in that city. The company has already been formed.

New additions are to be made to the Weatherford Pottery at Weatherford, Texas, and the capacity increased somewhat. Fred Melchor is the manager.

Mr. F. S. Lowry of Roseville, Ohio, is improving his plant in that city and some new machinery is now being installed.

The offices of the J. B. Owens Pottery Company at Zanesville, Ohio, will be removed from their present location to an office building erected for that purpose near to the factory.

The new plant of the Novelty Pottery Company at Crooksville, Ohio, is progressing nicely. The buildings which are of brick, are nearlv completed and as soon as the buildings are completed, the machinery will be installed and the kilns, two in number, will be erected. A. P. Prints will be the manager of the new concern.

The Ohio Pottery Company of Zanesville, Ohio, will erect a $20,000 addition to their works immediately for the manufacture of cooking ware, an invention of their own. The buildings will be started at once and will be rushed through to completion as soon as started. It is probable that new kilns will be erected also.

Mr. Talor who has been secretary and treasurer of the Columbus Pottery Company of Columbus, Ohio, has disposed of his interests in that concern and will resign his office in same. The plant will be completed within a short time. Mr. George Hasbrook is president of the company.

Mr. Geo. C. Scott who has been general manager of the Coffeyville Pottery and Clay Company of Coffeyville, Kansas, has resigned and will retire from the company. It is said that Mr. Scott will go to Tennessee where a new pottery is talked of.

The Norris Mining and Manufacturing Company of Pittsburg, Pa., and whose works are located at New Salisbury, Ohio, will erect eight new kilns at their brick plant there. The contract has already been placed for the above and work has been started.

The Oak Harbor China Company of Oak Harbor, Ohio, has been incorporated with a capital stock of $100,000. Mr. W. J. Harvey of the W. J. Harvey China Company, of Masontown, Pa., is the promoter of the new company and will, no doubt, be general manager of same.

At the annual meeting of the Acme Pottery Company of Crooksville, Ohio, J. J. Hull was elected president, Elwood Newbury vice-president, Lewis Springer secretary and treasurer and T. H. McNicol superintendent.

The American Hydraulic Stone Company of East Liverpool, Ohio, has been incorporated under the laws of Ohio to erect a plant for the manufacture of artificial stone and vitrified clay goods. J. E. Gamble is president, W. G. Morris, vice-president, R. L. Cawood secretary, J. S. Scott treasurer and H Chambers manager.

Mr. J. G. Burley of the Burley-Winter Pottery Company of Crooksville, Ohio, has received the appointment as postmaster at that town. Mr. Burley is secretary and manager of the pottery.

The new additions to the Rookwood Pottery Company at Cincinnati, Ohio, have been completed and are now in operation. The company is making an artistic and strictly high grade architectural terra cotta in the new addition and already have some large contracts on hand for the same. Their capital stock was recently increased from $60,000 to $120,000 to provide for their recent additions.

It is said that the Homer Laughlin China Company of East Liverpool, will shortly go into the manufacture of vitrified china on a large scale, erecting a plant for that purpose.

The Union Potteries Company of Pittsburg, Pa., have decided not to rebuild the Chelsea Pottery Works at New Cumberland, W. Va. The Union plant at East Liverpool, Ohio, is also offered for sale.

The kilns at the new works of the Bell Pottery Company of Columbus, Ohio, are nearly completed and the plant will be ready to start up within the next two weeks. Everything is now ready to make a start just as soon as some materials come in.

The Weller Pottery that is being erected on the Midway at St. Louis, Mo., is now almost completed and will be ready for operation by the last part of this month. The machinery is now being installed in same and everything being placed in readiness to make a start a day or two before the exposition opens.

Miss Marv Chase Perry of Detroit, Mich., who has been operating a minature pottery in that city, it is reported, will start a larger one in the near future.

The E. D. Freeman Electric Porcelain Company of Trenton, N. J., has been incorporated with a capital stock of $25,000. The incorporators are E. D. Freeman, Lambert Albaugh and H. B. Autcault. The company will manufacture all kinds of electric porcelain, including cleats, insulators, tubes, etc.

The new plant of the Novelty Pottery Company at Crooksville, will be ready to make a start within the next two weeks. The machinery is now being installed in same.

The Mosaic Tile Company have placed a contract for a large two-story addition to their plant at Zanesville, Ohio. New kilns will be erected and new machinery installed. They are going into the manufacture of glazed tile along with their regular line of mosaics.

The new pottery at Syracuse, N. Y., is now taking a definite hold. Nearly all of the stock has been subscribed and plans are now being prepared for same. The buildings will be started within the next thirty days. Mr. F. L. Webb is the head of the concern.

Mr. Wm. Seanger of Elmdorf, Texas, will double the capacity of his plant some time this summer.

The Locke Insulator Manufacturing Company, Victor, N. Y., are installing some new machinery and will almost double the capacity of their plant some time this summer. Mr. J. S. Lapp is now back with the concern as secretary and treasurer.

The F. H. Weeks Pottery at Akron, Ohio, was recently destroyed by fire with a loss of from $15,000 to $20,000. Mr. Weeks will probably rebuild the plant, although he has decided on nothing as yet. The plant was on old one and the new one will, if erected, be a model plant, being up-to-date in every detail.

Work upon the new improvements at the Lyons Stoneware Company, of Lyons, N. Y., has been started and will be completed within three weeks. The plants will be changed from an old plant where every piece of ware made, is manufactured by hand, to a modern pottery, where everything will be made by machinery. The work is being done by East Liverpool, Ohio, parties.

The Akron Insulator and Marble Company of Akron, Ohio, are adding the manufacture of door knobs to their regular line of electrical porcelain.

East Liverpool, Ohio, March 10, 1904. TOM POTTER.

THE

Parson System

Saves Money

In Your Boiler Plant and Other Furnaces.

— *HOW* —

By Elimination of Clinker.
Uniform Steam.
No Grate Bar Renewals.
Steady Work from Your Boilers.
Burning Cheap Fuel.
Producing Clean Ash.

If you are interested, let us send you our booklet.

Parson Manufacturing Company,

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The Latest Fountain Pen. Guaranteed by Makers. No Filler. No Lost Time. No Spoiled Fingers. Perfect. Simple.

REMARKABLE OFFER.

The Old Way

We will send this famous gold-pointed pen, post paid, and THE CLAY-WORKER, for one year, to any address in the United States and Canada for **$3.00**

"POST" SELF FILLING CLEANING FOUNTAIN PEN.

Gen. Lew Wallace, the author of "Ben Hur," writes: "I have tried every kind in the market, and unhesitatingly give the preference to the "Post."

ADDRESS THE CLAY-WORKER, INDIANAPOLIS, IND.

The New Way.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

WHAT KIND of luck is the brickmaker having? As a general thing it is not of the best, as it is only by spells, and short ones at that. Things seem to have the facility of working away from the brick manufacturer, when he fully expects to be on the way to a streak of real good luck. With the close of navigation, though the prices were not as high as was expected, there was a cry that there would be a great shortage of stock on hand as compared with former years. This ought to have turned his luck the right way, as the stock held should command a good price, as it must be some time before navigation would open and new brick be on the market.

Taking stock at the end of December was somewhat of a surprise to all, as the large shortage that was hoped for did not materialize. Only about six million less in Haverstraw than the year previous. In 1902, at the time of stock taking, there were 76,475,000 brick on hand. In 1903, 70,330,000.

WINTER WEATHER

Set in and stayed, which has been a benefit, for the reason that it stopped the shipment of brick, and such jobs as were under way could get their supply from the boats up to a certain time. The material man has brick stocked which he wants to use. Generally about the last of January there is a break-up and free shipment on the Hudson from Haverstraw is in order. This is about the conditions in other years, so that there was no way to control the shipment, for when open water is in sight they will ship, you know. As the weather gets warmer, the river opens up gradually till shipment comes from the whole length of the river and generally results in the buyer's favor.

This year there is a great change in conditions for the brickmaker; along about the middle of March the river was still a sheet of ice. The intense cold furnished a heavy crop of ice in all the rivers, and the fall of snow was so heavy that there was a complete suspension of work on the buildings, so that there was no call for brick, therefore it would make no difference as to what the price was. The brick could not be sent to market, as there was a foot and a half of ice in the way of navigation, from shore to shore. Will this benefit the price of brick? It certainly ought to. It does not seem possible, but in the middle of March Haverstraw or Hackensack brick could not reach New York market by water on account of the ice.

A SAMPLE OF THE WEATHER.

After a long winter there was not much encouragement for early starting of brickmaking, when on the 14th of March there was a fall of four inches of snow and the thermometer about 20 degrees above zero each morning and during the day go up to about 40 degrees, only to fall back again in the evening.

The demand for brick will not be any better than previous years, to judge from the number of permits which are being taken out.

From the 1st of January to the 12th of March, 1903, 336 permits; from the 1st of January to the 12th of March, 1904, 335 permits. This shows that the number is about the same. In regard to the class of buildings and the cost of same, the difference is somewhat greater. The 336 permits of 1903 cost $13,230,350. The 335 of 1904 are estimated to cost $9,955,605, over three and a quarter millions in favor of 1903.

The outlook for the coming season, as outlined by those who are conversant with the conditions, is very gloomy, in fact, they claim that it will be one of the dullest seasons known to the building trade in New York City. Within one week there were twenty million dollars' worth of proposed work withdrawn from the architects, which was being prepared for the builders. Various causes ere given for the withdrawal to another year. Tight money and the results of the strike of last year being given as reasons, as well as the high price of materials which goes in the construction of a building. All materials have honorable mention at being high-priced except brick, and they are never mentioned at all, and low they are when compared with the other material used, even nails. And there is no one to blame but the brick manufacturer.

As the result of the floods of last fall there is an unusual amount of water in the clay banks, and to remove all this is now the question in the minds of the brickmakers. Perhaps some of your readers have been on the Haverstraw yards and can well imagine how much water has accumulated when I say that, starting from the first yard above town, the Excelsior yard, and from that point up to Peck's yard, it is claimed that there is at least six feet of water on the level above the banks You can form some idea of what a job it is going to be to remove all this. There has been some talk of all the owners getting together and have this done at one time and share the expense between them, but the Excelsior will not contribute anything toward the fund because they have abandoned the clay bank and get their material from the river and it makes no difference to them whether the hole is full or empty. It will keep pumps at work night and day to get the water out by the time brickmaking begins. The brickmakers have been trying to get together on this since the first of November, and the first of March there was no understanding The contract to remove the water was to be let to New York parties. It always requires some time in the spring to get the accumulated water out, and the holes being out of sight it will take some time for the bank engine to get it out of the bottom so it can dry.

An Oldtimer.

L.V.

SOMETHING NEW FOR INDUSTRIES.

THE LEHIGH VALLEY RAILROAD CO.

is about to open a new territory in the New Jersey Clay Belt. Very desirable locations are offered to manufacturers of Clay and Kaolin products. For further information address P. H. BURNETT,
Industrial Agent,
143 Liberty St., New York.

SAWS

ODD LENGTHS OF RUBBER, AND GIANT RED STITCHED,

from 2 ft. to 80 ft long, and from 1 in. to 16 in wide; 3, 4, 5, 6 and 8 ply FIRST-CLASS BELTING less than mfrs. cost prices. GET OUR PRICES on Rawhide, Paulins, Tank Pumps, Hose, Injectors Steam Gauges, Brass Fittings, Lard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Sawing Machines, One-Man Log Saws Asphalt Felt Roofing, Endless Thresher Belts. One Trial will make you a regular customer of the

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Send for Catalogue.

UNION STEAM PUMP

RUBBER BELTING

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. XLI. INDIANAPOLIS, IND., MAY, 1904. No. 5.

Written for The Clay-Worker.

POINTS OF PERFECTION IN STREET PAVEMENTS.

Superiority of Vitrified Brick Over All Other Paving Materials Fully Demonstrated.

THE PERFECT PAVEMENT, like the perfect man, will only come with the millennium, but all things considered, the well-laid brick pavement comes the nearest to perfection of any paving material now in use. From the viewpoint of durability and economy, brick pavements certainly are best. This is fully demonstrated by the brick streets of Terre Haute, Ind., some of which are pictured in the accompanying illustrations. These pavements, which have been down from ten to fifteen years, show no perceptible wear, though subject to heavy traffic. It is no exaggeration to state that from present appearances these pavements will be just as good at the end of another fifteen years as they are to-day. Surely, this could not be said of any other paving material.

The American asphalt covering has been tried and found wanting. The same is true of wood pavements, for no amount of creosoting or doctoring of any sort can make wooden block durable as a paving material. Its chief point of merit lies in its being comparatively noiseless, but this illy compensates for its unsanitary character as soon as decay sets in. In this respect it is the least desirable of any of our paving materials. The ideal pavement should have a surface which affords a safe foothold for horses. In this respect macadam excels, but it is so lacking in the essential quality of durability, and is so insufferably dusty during dry weather and muddy in wet weather that it cannot be considered seriously as a permanent paving material. Brick pavements, while not so satisfactory as a speedway for horses as macadam, is less objectionable on this score than either asphalt or wooden block, for horses seldom or never slip on a brick pavement.

In all other respects brick pavement meets all of the conditions of the ideal pavement. It is as enduring as time, does not originate dust, and being non-absorbent, is a sanitary covering. It is an absolute protection from the earth below, it washes clean and after a few years develops a gritty surface well suited to the travel of horses. It is easily and cheaply cleaned and requires a minimum of water where sprinkling is desirable, because it is non-absorbent.

It took about the same number of years to develop the merits of brick pavements as it did to develop the demerits of the composition pavement. There can be no gainsaying the fact that the first brick laid as a street-paving material were laid in a very faulty manner. At first any kind of a fairly hard brick was used. The idea of a brick pavement did not carry with it the suggestion that anything more than a good common hard brick was needed. The foundations were sadly neglected. The substructure received very little attention. Often sand was placed directly upon it and then the brick. At times bricks laid flatways were used for foundations, and these were usually the softer brick. What with a poor substructure, a poor foundation and indifferent brick, ignorantly laid, the early brick pavements were very faulty, and their bad early life has had to be lived down.

A PERFECT PAVEMENT AFTER 13 YEARS' USE.

South Sixth Street, Terre Haute, Ind. Principal Residence Street of the City. Laid in 1891 With "Metropolitan," Canton, Ohio, Wire-Cut Small Brick.

The promoters of other pavements were able to point out many bad examples and sell millions of dollars' worth of covering through the exhibition of these bad examples ignorantly or innocently foisted upon the people by paving contractors. There are very few cities in the country that have not suffered in this way. Yet pavements of this kind are in infinitely better condition to-day than are those of asphalt laid at the same time, and have outlasted more than one wood pavement. These faulty brick pavements appeared at their worst right at the beginning, and to-day after many years of wear are no worse and sometimes even better than during their early months.

Brick Should Not be Wheeled Over the Pavement, but Carried on Boards and Placed so as to be Laid Face Side Up.

Laid Properly, Brick Pavements Wear Perfectly Smooth.

Object Lessons In the Construction Of a Perfect Pavement.

The Last Inspection of the Brick Preceding the Application of the Joint (Cement) Filler.

After it had been discovered that concrete was desirable for foundations, "any old concrete" was used. It was put on thin on a badly prepared sub-bed, badly mixed, of poor cement, unclean gravel and sand, and laid with little regard to the evenness of the surface. Then the brick were placed almost directly on the concrete. It took some little time for the people and the engineers to find out just what was the matter. Now they know.

We have brick pavements in Indiana that have been down from twelve to thirteen years absolutely without repair which are in better condition to-day than the day they were laid, and which certainly will last indefinitely. How can a pavement be better than the day it was laid? may be asked. The answer is, by the wearing off of the rough edges and thin, smooth glaze found on the surface and the development of a surface which has a kind of a grain or texture which is more agreeable to horses and more satisfactory in the traction of automobiles and bicycles.

Terre Haute, Ind., has typical examples of the ideal brick pavement. There are other cities where the work has been done as well, but this city presents good examples of streets ten, twelve or more years of age, and affords an opportunity of considering a typical method of great excellence. It may be well to state in advance that this work in Terre Haute was done according to the method early insisted on by Engineer George R. Grimes, and later recommended by the National Brick Manufacturers' Association, and that the brick were tested by the standard N. B. M. A. Rattler method. The method pursued in Terre Haute will be definitely set forth in short form.

SUB-GRADE.

Beginning with the excavation for the substructure, the earth was removed by a plough, scraper or other device within two inches of the subgrade, then brought to a true level by hand trimming, after which it was rolled by steam machines weighing not less than five nor more than eight tons. Where it was found that the earth was too hard to be compressed in this way a sufficient amount to bring it to the subgrade was cut away with a pick. As this subgrade is the ultimate support of the pavement, it must be understood that great care must be exercised in its preparation. Everything which goes on top is dependent upon it. Old cuts, soft fills, spongy soil must in many cases be removed and suitable filling provided. Oftentimes it may appear that gravel, sand or broken stone should take the place of this re-

Applying Second Coat of Cement Filler Which Should be Done Quickly After the Application of the First Coat.

moved materlai; but under any circumstances it is necessary that all should be removed and the parts which have been filled rolled at the same time and uniform with the original earth. It will often be found that under-draining is necessary. This any engineer or practical street builder can determine by an examination of the soil, or, in event of doubt, by borings. The finished subgrade should be smooth and of the same uniform contour as the pavement itself. It can be rendered smooth and solid only by the proper rolling of a properly prepared surface. Professor Baker, of Champaign, Ill., recommends both longitudinal and cross rolling, and this is no doubt desirable.

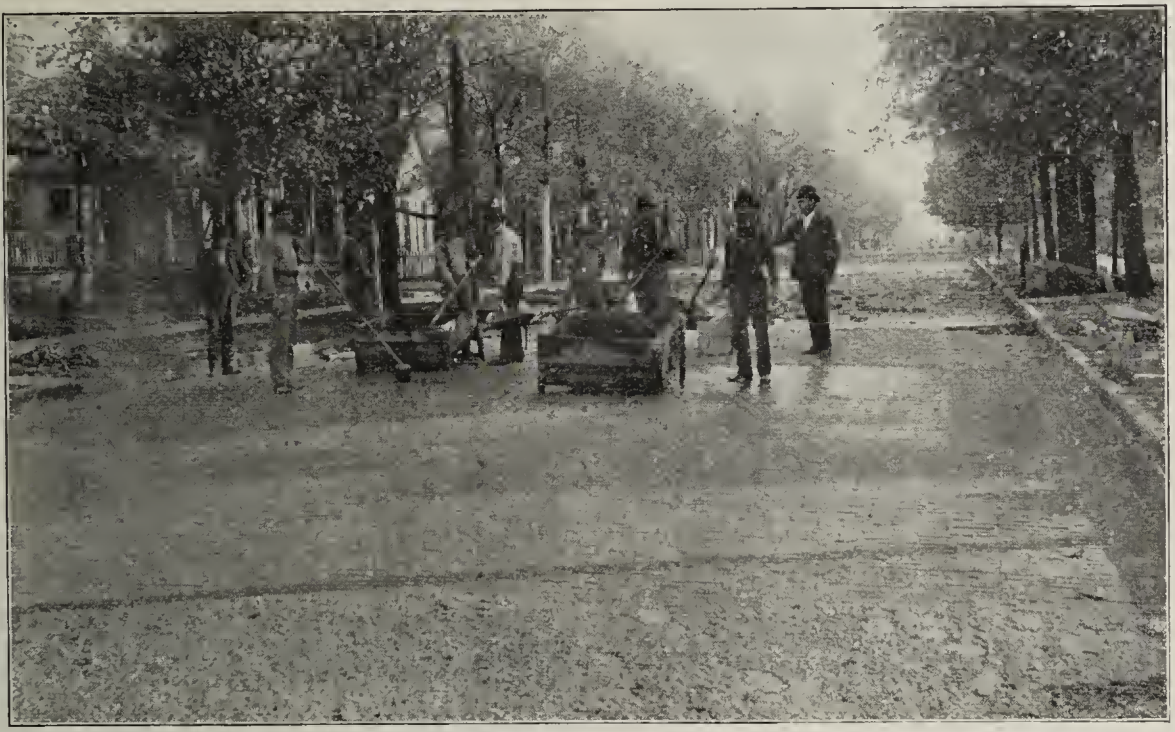
South Ninth Street, Terre Haute, Ind., Paved in 1892 With Standard Wire-Cut Brick, Which Were Rejected the Previous Year in Paving South Sixth Street.

It is the opinion of the writer that none other than a concrete base should be considered. It was the laying of brick on gravel, broken stone and culled brick foundations that held this paving material back many years, but we still find advocates of the gravel or broken stone foundations in lieu of concrete because it is cheaper. It is called a "just-as-good" material. Other kinds of foundations than concrete have been experimented with for years, and all over the world, with the result that where we find the best pavements by the best engineers none other than concrete foundations are considered. In the older communities where the experience is the greatest all thought of other foundations has been abandoned.

CONCRETE FOUNDATION.

The foundations may be six inches in thickness and made of American Portland cement, broken stone and sand or gravel. Under present conditions there is no object in using a cement other than Portland. The same degree of hardness can be obtained at a less cost with Portland than with any other cement. It is cheaper in proportion to its strength than that made with natural cement. Most of the concrete at Terre Haute was mixed by hand. The sand was sharp and dry and thoroughly mixed with the cement in its dry state until the whole mass showed an even shade. If hydraulic cement was used the mixture was one part of cement to two parts of sand. If Portland cement, one part of cement and three of sand. To the above mixture was added water to bring it to a plastic state, and the whole was made fluid enough to rapidly subside when heaped to a cone-shaped form. To this mixture was added four and five parts respectively of damp crushed stone or clean, screened gravel. This was turned over not less than three times, or until every fragment was thoroughly coated with the cement mixture. The better way to mix concrete is by machine. The material should be measured by hand and mixed by the machine. It is the judgment of the most eminent engineers that this is the only proper way to mix concrete, and that 1 to 6 or 7 mixture of gravel and sand makes a better foundation when mixed with the machine than a five-to-one mixture when mixed by hand. Where gravel and sand are obtainable in proper proportions they may be mixed together with the cement and without the screening of sand. In many sections of the country this is universally done, and the result is eminently

Brick Pavements Which Have Improved With Wear.



Horses Seldom Or Never Slip On These Brick Pavements.

Paving South Fourth Street with Terre Haute Brick & Pipe Co.'s Paving Block, Illustrating Method of Applying Cement Filler, According to N. B. M. A. Specifications.

Tippecanoe Street, Terre Haute, Ind., Paved in 1896 With Terre Haute Brick & Pipe Co's Small Repressed Brick, Subject to Heavy Freight Hauling and Rapid Hack Driving. No Perceptible Wear.

satisfactory. This of course depends on the proportionate character of the sand or gravel.

Before the concrete is applied to the subgrade it should be set off in five-foot squares, with a stake at each corner, the tops of which should be the surface of the concrete, which must be tamped until free mortar appears upon the surface. Occasional sprinkling during dry, hot weather will be found beneficial. In from thirty-six to forty-eight hours the sand cushion may be applied. There should be no hard and fast rules about this, however. It is safe to say that the cushion should not be applied until the concrete has been placed at least thirty-six hours, and then if it is not hard enough it should have additional time. No amount of description will take the place of the judgment developed by actual practice. The concrete foundation should be smooth and formed so that it conforms exactly in its proper relation to the finished street above.

South Eighth Street (Semi-Wholesale District), Terre Haute, Ind., Paved in 1893 With Wabash Clay Co.'s Small Repressed Brick.

THE SAND CUSHION.

The sand cushion two inches in thickness should be clean, sharp sand, which must be free from all foreign matter, and it is desirable that it should be uniformly dry so that the finished surface may readily be maintained as a uniform bed. It should be spread by the aid of a templet, and the whole or the half of the street may be formed at once to the proper curvature. Here again accuracy and uniformity are essential.

THE BRICK.

It is owing to the work of the N. B. M. A. that the present standard of paving brick has been achieved. The Association has fixed the standard and through the interchange of experience among its members and in convention, methods for realizing this standard of excellence have been definitely worked out and are generally understood. Paving brick are made more skillfully, more intelligently and are subject to less experiment than any other paving material. The Rattler test has done its part in giving definite assurance of quality. It is a fact that paving brick is the only material used for street covering that may be thoroughly inspected and its character definitely determined before it is put on the market. There need be no doubt or obscurity as to the quality and character of brick used for street covering.

The paving brick at Terre Haute are thoroughly vitrified and harder and tougher than granite and as non-absorbent as glass. They are made with rounded edges with no greater radius than three-sixteenths of an inch. The various makes differ in size from two and a half by four by eight inches to three and a quarter by four by nine inches. Slight kiln marks are allowed on one edge, and it is required that there should be one straight face. The Terre Haute brick are spoken of in a typical sense. The same character of brick are made in different parts of the country.

Professor Baker is of the opinion that the round corners should not be used. He says that the round corner is more objectionable with the cement than with the sand filler. But in the light of the experience of the present day there is no reason why a sand filler should be considered for a minute.

Bricks should be laid at right angles to the curb, and broken bricks should be used only for closures or in starting courses. They should, of course, be laid on edge and close together. The brick should be carried to their place by hand and not in wheelbarrows. After they have been laid they should be carefully inspected again, and any brick that appears rough, spalled, out of alignment, soft or otherwise imperfect should be removed and replaced by those which are satisfactory. It oftentimes appears that a bad face may be turned down and thus the brick saved. After this inspection the brick next to the curb should be hand-tamped a foot or more from the curb, after which the entire surface should be rolled with a five-ton steam roller until all of the bricks are thoroughly and uniformly bedded, after conforming to the proper curvature of the street.

Beginning with the soil, this matter of contour and smoothness must be preserved in parallel lines from top to bottom, and care, always care and thoroughness, fine discrimination and a serious, fine judgment that will develop the ideal pavement.

THE CEMENT FILLER.

After the brick have been laid and compacted an important element is yet to come, and that is the filler. One may do all of the other work never so well and yet if the filler be not properly made the result will not be satisfactory. Boxes in which the filler is mixed are shown in the pictures. It should be composed of one part of clean, sharp sand—washed sand, if possible—and one part Portland cement. The sand should be dry before the mixture is made. The batch should not exceed one-third of a bushel at a time, and, of course, a like amount of cement, and should be mixed dry in a box until the mass assumes an even, unbroken shade. Water should be added until the mixture assumes the consistency of thin cream. From the time the water is applied until the last particle is removed from the box and floated into the joints the mixture should never be allowed to rest for a moment. It should be kept constantly in motion, first with the hoe, then with the scoop and finally with the brushes as it is brushed in between the joints. This mixture should be removed from the box to the street surface with a large scoop shovel. The box for this purpose should be four feet long, thirty inches wide and about fourteen inches deep and resting on legs so as to form a lower corner, which should be ten inches above the pavement.

Alley Between Main and Ohio and Sixth and Seventh Streets, Terre Haute, Ind., Paved in 1896 with Terre Haute Small Repressed Brick. Illustrates the Highest Possible Sanitation for Alley Construction.

Immediately the mixture is poured from the scoop onto the pavement it should be thoroughly swept into the joints. In Terre Haute the practice is to use two boxes where the street is twenty feet or less in width and three boxes where the street is more than twenty. This keeps them as close as possible to the actual work. It is good practice to have the work carried forward in a line until an advance of from fifteen to twenty yards is made, when the same force may be turned back and go over the space again in the same manner as before, excepting that the second coating should be slightly thicker than the first.

It is imperative that a helper with a large sprinkling can with perforated head with small holes should be at hand to sprinkle the filler to avoid the possibility of a decided thickening at any point. Thus, the sweepers are enabled to brush all of the cement mixture into the openings and prevent any of it from resting on the face of the brick. This work should be done in the application of each course of the filler.

A sufficient length of time after the last coating has been put on, and when it has been determined that the joints are flush on the top with the filler, one-half inch of sand must be spread over the whole surface. This must not be done, however, until there has been sufficient evaporation so that the sand coating will not absorb any of the mixture. In hot summer weather an occasional sprinkling is imperative in order to keep the sand damp. This should be kept up for two, three or four days, depending, of course, on the character of the weather.

The grouting should be left free from vibration or disturbance of any kind for a period of not less than ten days, excepting when it is necessary to go over to sprinkle it.

An expansion joint may be put in next the curb.

IMPERATIVE FEATURES.

Altogether there are five distinct and imperative steps in the construction of a brick pavement. Should there be a failure in any one, the work is a relative failure. They are:

First, the subgrade.
Second, the concrete base.
Third, the sand cushion.
Fourth, the brick and their application.
Fifth, the filler.

There is no one of these points more important than another. Each is imperative.

One authority has said that more disaster comes to a brick street from the want of a proper filler, properly applied, than from any other cause, but if this same authority be followed up the same expressions in regard to each of the points above named will be heard. The fact of the whole business is that there is no difference in importance in the five steps above named. Each is necessary to form a proper integral mass and an ideal pavement.

There has been a constant effort to get rid of the concrete foundation, because it increases the expense of the pavement. Every one who put down brick pavements in the beginning of their use had a strong underlying impression that the concrete was desirable and necessary, but in each case the individual was struggling against his sense of what he knew to be right. No longer ago than the last convention of the N. B. M. A., Prof. Baker presented ingenious arguments to indicate that cement might be done away with in the foundation. He said: "A little computation would show that the cost of the cement filler was about the same as that in the usual concrete, and therefore it would be better economy to employ the cement in the filler than in a concrete foundation." Why should this conclusion follow the fact stated? This statement is prefaced and followed with argument to prove that the cement in the foundation may be omitted. The thought, of course, in the mind of Professor Baker is to reduce the cost of the pavement without reducing its efficiency, and this argument is presented in a paper on brick paving which otherwise is probably the best that ever came before any body of brickmakers. If any one will show a pavement constructed without the concrete foundations it will be found to need excuses and explanations. The people who pay for pavements have never favored one because it is cheap. There is always the hope of getting something better. If some one comes along with a pavement that is distinctly better than anything that has ever been presented to the pavement building world before, the people will buy it at a fifty per cent. additional cost. The pavement building world moved directly from cheap gravel and boulders to asphalt and block pavement. They grumbled a little about the cost, but they paid out immense sums in the mere hope of getting something better. The block pavements have been replaced time after time at a great expense and the asphalt pavements have been patched and resurfaced. But no one would go back to a cheap pavement merely because they were cheap. It should be the business of every manufacturer of paving brick to resist any effort to cheapen the foundation with a view of preserving the reputation and increasing the sale of his product.

The brick pavement is the most practical, the most economical known to-day when it is laid right. It has had an uphill struggle to attain its present reputation and was held back for years more on account of poor foundation than for any other cause. But now that we have the brick, the knowledge of how to apply the filler and other engineering data, the whole world will soon come to recognize the excellence of a brick covering.

Pavements which have been laid along the lines indicated in this matter not only present a better surface than when they are first laid, but the parts of the street that have had the most wear within twelve or more years are in best condition.

The writer wishes to absolve himself from the desire to promulgate theories of his own on this subject. This paper is a compilation based upon the history and construction of successful pavements and those which the second and third generations and maybe others will be riding over. LOUIS H. GIBSON.

CLAYWORKING INDUSTRIES OF THE UNITED STATES.

A chart showing in tabular form the quantity and value of the clay products of the United States in 1902 as distributed throughout the several States was published by the United States Geological Survey late in 1903. That is now supplemented by the publication of a report entitled "Statistics of the Clayworking Industries in the United States in 1902." The author of both chart and report is Mr. Jefferson Middleton, who did the work under the supervision of Dr. David T. Day, chief of the Division of Mining and Mineral Resources.

The year 1902 was one of prosperity in the clayworking industries, the product reported increasing from $110,211,587 in 1901 to $122,169,531 in 1902, a gain of $11,957,944 or 10.85 per cent. It is significant, however, that the firms reporting in 1902 numbered but 6,045 as against 6,421 in 1901, the figures showing a decrease of 376, or 5.86 per cent. This decrease can be accounted for only by the fact that many individual firms have combined and reported as one plant, as no plants of importance that reported in 1901, except one in Texas, are delinquent in 1902. This is further shown by the fact that the average value of the output per plant increased from $17,164 in 1901 to $20,210 in 1902. A remarkable advance in the cost of labor and building materials began in 1900, and although it does not seem to have had a serious effect on the clayworking industries during 1902, it is probable that it prevented the value of the clay product from rising above $126,000,000 in 1902, as it normally would have done.

The great coal strike of 1902 would seem to have had little direct effect on the brick and tile industry, although the pottery industry in the Eastern States, where considerable anthracite coal is used, may have suffered to some extent from the strike. The increased cost of fuel which followed the strike will undoubtedly make itself felt in the brick and tile industry in increased cost to the consumer.

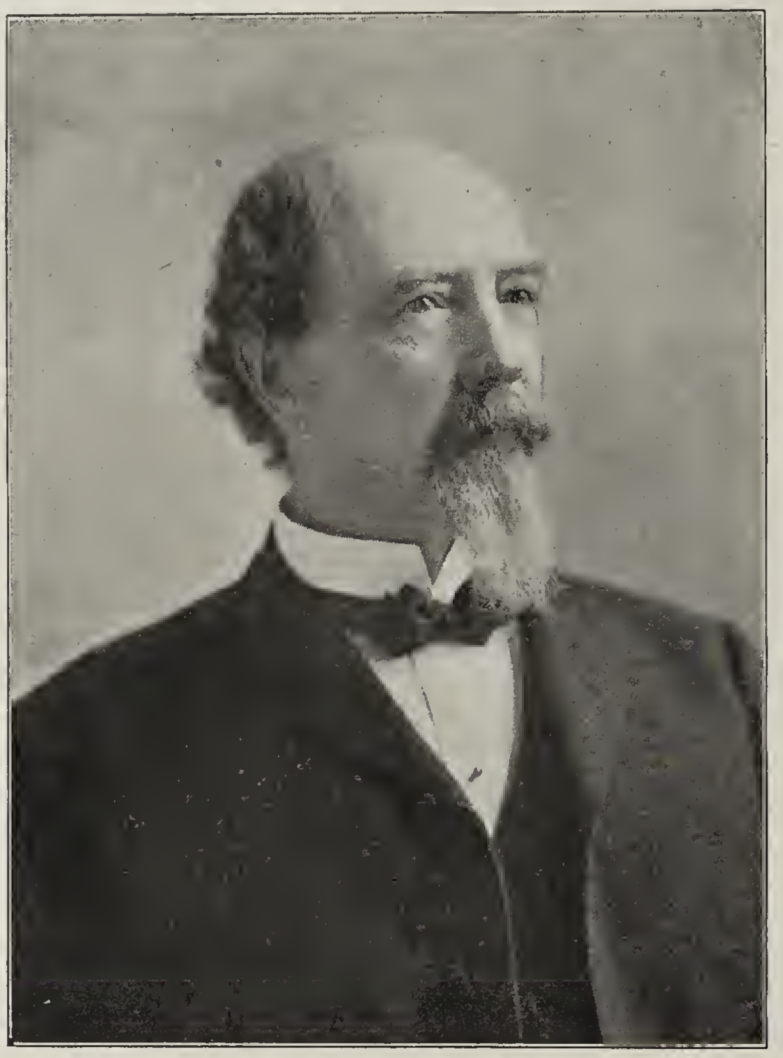
One of the most significant features of the year was the successful installation of several plants for the manufacture of sand-lime brick. At the close of the year three or four plants of this character were in operation in different sections of the country, with the prospect of a large increase in their number in the near future. There seems to be no doubt that the manufacture of this class of brick will be successfully carried on in many localities. It is equally certain that sand-lime brick will not wholly displace clay brick.

Written for THE CLAY-WORKER.

WINKLE TERRA COTTA WORKS.

THE WINKLE TERRA COTTA COMPANY'S works at St. Louis is one of the pioneer plants of the country, in time, in artistic excellence and in scientific and progressive ideas. As such it will certainly be an object of interest to the large number of readers of THE CLAY-WORKER who will visit the great World's Fair that opened here April 30th.

The works and offices are unpretentious in appearance from the outside and do not convey an idea of the extent nor importance of the plant. Like many successful concerns this one has grown from a very small commencement and like most such plants carries on some part of it—usually the offices—the impress of the earlier days; this is particularly the case where the principal management is still under control of the original founder, for however progressive a man may be, however eager to adopt novel and original ideas of value, he has a feeling of affection for the old office arrangements, which are associated in his memory with many an anxious moment and many a soul-strengthening triumph.



Joseph Winkle, Pres. Winkle Terra Cotta Co., St. Louis, Mo.

The Winkle Terra Cotta Works were started by Mr. Joseph Winkle, who is now president of the company, in 1882. In 1859 Mr. Winkle came to the United States from England, in which country he had received a thorough practical and technical training as a potter. The Winkle family had indeed been, for several generations, connected with the potters' craft. The present company is a close corporation, that is, it is regularly incorporated, but the stock is chiefly held by members of the family. The founder of the business is the president, and Mr. Andrew Winkle, his eldest son, the first one born in the United States, is vice-president; the secretary and treasurer, Mr. John G. Hewitt, is the president's nephew, and his brother, Andrew J. Hewitt, is one of the directors and has charge of the factory office.

Starting in St. Louis from the up-to-date city offices of the Terra Cotta Company in the big skyscraper, the Century Building, we take a Suburban car and, for the sum of one nickel, are carried to the suburbs of St. Louis—but which the growing city is rapidly converting from suburban to urban—past the Evens & Howard fire-brick works and deposited at the entrance to the Winkle Terra Cotta Cotta Works. Conducted through an archway, across a small courtyard, we enter the shops and are surprised to find how extensive they are. The plaster room is 100 feet by 40 feet; the modeling shop 50x30 feet; the first fitting room is 80x70 feet, the second 100x70 feet, the first pressing and drying room 130x70 feet, the second is the same size, the third 247x33 feet, fourth 247x33 feet, fifth 100x70 feet, sixth 100x70 feet and the seventh and eighth, which are not yet in use, are each 145x46 feet. Then we find a spraying room of 100x70 feet, besides immense clay storage cellars, to which reference will be made later. The whole plant covers about six acres of ground.

—Effect of Pure Water on Boiler—

The engine and boiler rooms present no unusual features. The boilers, four in number, are tubular, each is 72 inch by 22 feet. The principal engine is a Rankine-Corliss of 150 h. p. In the engine room is a pre-heater for the water entering the boiler. This is heated by exhaust steam. This led up to a question that brought out a very interesting fact. Knowing from a four years' residence in St. Louis the character of the water in our great river, which with the exception of the Egyptian Nile is the muddiest I have ever washed in, I asked Mr. Andrew Winkle what he did with the mud and learned for a long while water furnished by the condensed steam has been used. When this was introduced, some years ago, it was a great improvement and economy. The water being in effect, distilled water, would be pure and there would be less waste of heat. The accepted opinion among engineers was that if all the steam could be condensed and returned to the boiler no scale would be found and the tubes would keep clean. This was found to be the case, but—there is so often a "but" or an "if" in our most cherished schemes—the boiler tubes were rapidly destroyed, they were badly "pitted" and the steel tubes were worse than iron. The repairs to the boilers became a serious matter and various compounds were tried, but common sal soda (sodium carbonate) was found to be a perfect cure. About eight pounds per day is the quantity used. Mr. Winkle was satisfied with the result and had no explanation to offer. It is well known that pure, or distilled water has a more energetic action upon metals, notably steel, than water charged with many kinds of impurities; it also has an affinity for carbon, which it converts into carbonic acid. This would account for the steel tubes suffering to a greater extent than the iron tubes, steel being a combination of iron and carbon by putting sodium carbonate in the boilers the condensation water, that is to say distilled water, gets all the carbon for which it has affinity and the surfaces of the steel tubes and boiler plates are consequently not attacked. In addition to the principal engine there are four others of from 10 to 40 h. p. for various purposes, lighting, repair shops, etc.

—Clays Used—

Beginning at the beginning with the clays. These are principally got from the company's own properties on the Missouri Pacific and Iron Mountain railroads, where it possesses 82 acres, on which is an immense deposit of a kaolin, burning to a pure white and on another property at Glencoe of about 70 acres. The clay from Glencoe is more plastic and burns to a buff color when alone. Clays are also brought from Tennessee and some ball and china clays are imported from England. The various clays used are mixed in the right proportions for the six kinds of stock, which are stored for curing in the cellars.

—Curing Clay—

The value of curing clay and the effect upon it of fermentation, that is to say of the action of bacteria, is disputed by many, both in this country and even in Germany. A most interesting paper upon this subject by Otto Bock of Berlin, read at the German Brickmakers' Convention, was published in full, with the discussion upon it, by THE CLAY-WORKER in the issues of August, September, October and November, 1903, which every clay-worker ought to have read. If I had had any doubt about the curing of clay and the effect of bacteriological action, which I did not have, it would have been removed by my visit to the Winkle Terra Cotta Works. Mr. Andrew Winkle is an essentially practical man. He certainly cannot be accused of being one of the scientific faddists and mere theorists. Speaking from his long experience he says that if the clay is "mellowing" for a year it is that much the better and he would not consent to use any under three months. Among the things he has noted is the odor, which he describes as a "graveyard odor" when the cellars have been open and the 16 incandescent electric lights on all the time. Of course it is impossible that ventilation alone may account for the absence of the fermentation odor, for when the lights are on it is likely that someone is at work in the cellars and the doors will probably be open. My recollection is not clear whether Mr. Winkle said he had tested this. It would be interesting to close the place and keep it in darkness for a sufficient length of time for the odor to develop, then, after well ventilating it, start again with the cellar closed for an equal length of time, but with all the 16 lights going. Perhaps President Winkle will make this little test some day for the benefit of our readers.

One thing is quite certain, the clay that is cured longer works smoother and does not crack in drying. There is never any cracking or checking in burning.

World's Fair Exhibit, Winkle Terra Cotta Co., St. Louis.

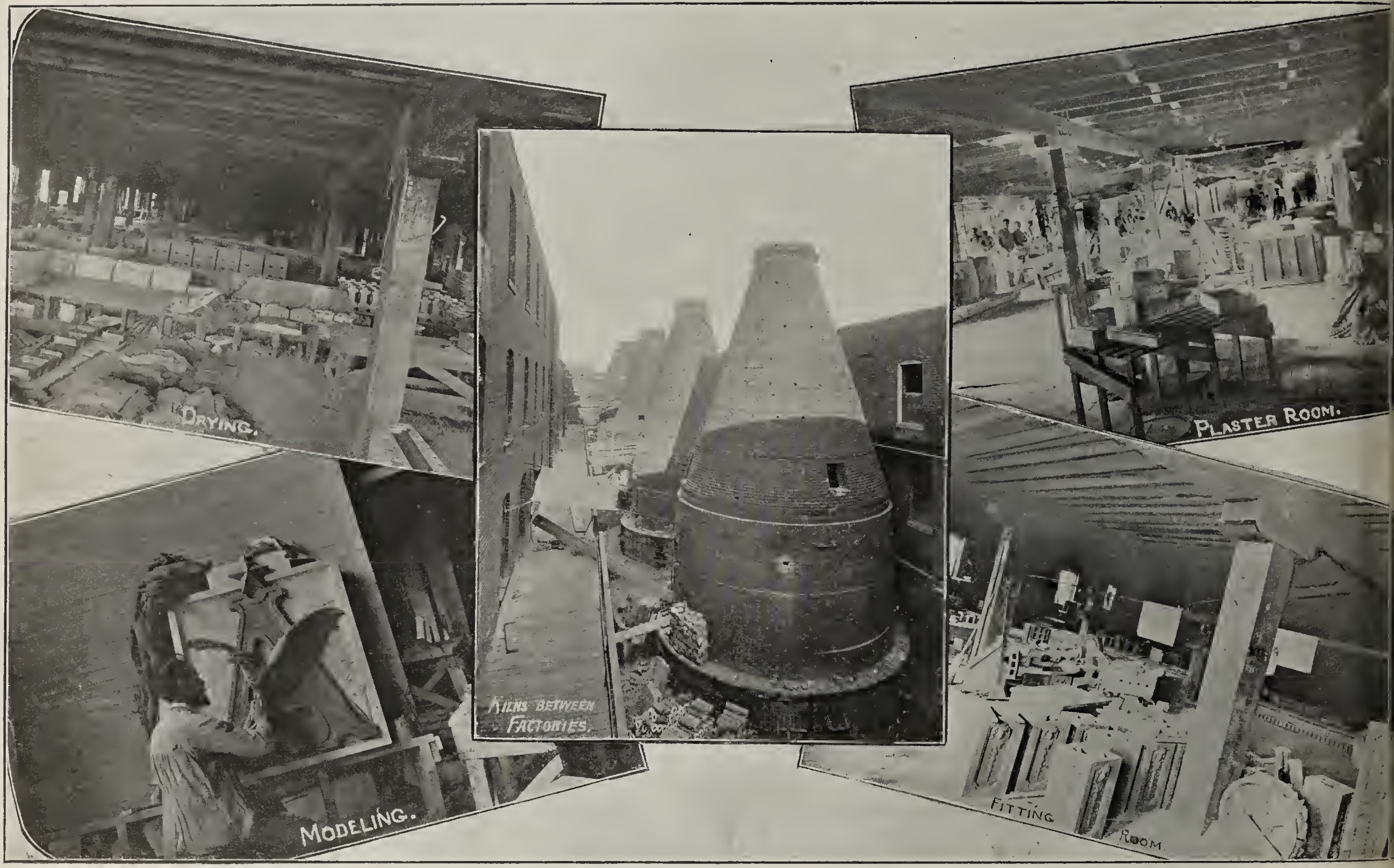
shut for a while and dark. This latter point which I have emphasized, is very significant. Bacteriologists know that one of the most active destroyers of fermentation microbes is sunlight, and most light, if not all light, in proportion to its energy, interferes with bacterial development. I remember when my mother, many, many years ago, used to make vinegar from sugar and water with the aid of a fungus called a vinegar plant, it was absolutely necessary to keep it in a moderately warm place and in the dark. Very good vinegar it made, too.

There was no odor at all at the time of my visit to the clay cellar. This was accounted for by the fact that the carpenters working there had been there all the morning, with the doors

The main storage cellar is 142x46 feet and is paved with vitrified brick. In this was 2,000 tons of clay packed in square, solid benches, a little over six feet high. The clay is all first tempered and mixed ready for use and, after it is piled, it is moistened three times a week. It takes a man about half an hour to do this for all the three clay stores, using a ¾-inch garden hose. I thought it was a 1-inch hose, but Mr. Winkle said it was extra strong as "the best is the cheapest," which applies to most things. Above the main cellar are two more clay stores on two upper floors. These are floored with 2-inch planks upon which there is a 3-inch covering of granitoid. These contain another 2,000 tons, making 4,000 tons in all of the regular stock of clay, consisting of the six different kinds, or mixings. When I was there last week a fine pug mill, made by the American Clay-Working Machinery Company of Bucyrus, was being installed in the main cellar. This will be driven by direct-coupled, 30 h. p., 110 volt motor. The motor is made by the Northern Electrical Company of Madison, Wis.

—The Plaster Shop—

The making of the plaster mold, though not the first, is one of the early stages of terra cotta work. It is an important branch of the plant for plaster molds wear out and frequently have to be renewed. The molds are made here in the usual way and do not call for any special remark. I noted that a soap paste, used to prevent the molds sticking, looked to be of good quality and asked whether this was made from ordinary or rosin soap. The reply was that common soap was not found to be serviceable. The highest grade of household soap is used, this, I learned, is a kind known as Babbitt's soap. It is made in New York, but it is said to be widely distributed. It works even better than castile soap. It is dissolved to a jelly-like consistency and kept in this state as a stock to be thinned to a solution for use.



Views in and about the Winkle Terra Cotta Works, St. Louis.

—Pressing Rooms—

The next stage in the work is the pressing, the clay of course having been prepared. The only preparation needed, after it comes from the curing cellar, is the addition of calcined clay, as much is required to counteract shrinkage. The calcine is crushed in a Gate's rock crusher and then ground in a dry pan. For the best work the calcine is specially burned. The clay is pressed into the plaster molds in the usual way, that is to say it is hurled in in lumps, then pressed and kneaded in place with the hands for the purpose of getting rid of the air to make the piece as homogeneous as possible. This is no mere laborer's work. Considerable skill and knowledge are needed and conscientious attention so that the resulting piece, when burned, shall be sound and well balanced and no undue strains be caused by one portion being much heavier than another.

—Modeling Room—

My view of the modeling room shows Sculptor J. Rollin at work, and this has been his workplace for the past ten or twelve years. Mr. Rollin's French name is due to his father, who was a well-known French artist, but our friend was, artistically at least, "made in Germany," for he studied at Munich under J. Pierrot, whose specialty was ornament. Mr. Rollin worked in Paris at the great exposition of 1878. He returned to Munich and afterwards came to this country, which he has adopted and made his home.

—Laboratory—

Passing the photographic dark-room, for all the photographic pieces produced here are photographed by one of the employes, we look into the laboratory. This is fitted up with the usual bottles, apparatus, chemical balance, stink closet, etc., and here I found my young friend S. Geijsbeek. He was, I believe, one of the first lot of trained ceramic chemists, or chemist ceramists that Professor Edward Orton, Jr., turned out at his admirable school at the University at Columbus, Ohio. The ceramic art of America is under a lasting debt of gratitude to the National Brick Manufacturers' Association and its officers, who by their active support so materially aided Professor Orton in the movement for the higher education of clayworkers in every branch of our art and craft.

The chemical laboratory here stands ready to handle any problem as it arises and problems, as we know, are frequent and unexpected. The routine work is that very important one of insuring adaptability of glaze or slip to the body for which it is intended. Without an exact fit, the boasted, everlasting quality of terra cotta is a myth. A very small change caused by the need for a different shade or color of slip or glaze may produce a very dangerous difference in its expansion ratio. Here is where the ceramic chemist comes in.

—Drying Room—

The drying room is the next step. The drying is done on a raised, open floor with steam piping beneath it. Exhaust steam is used during the daytime and live steam at night. When using live steam the pressure is from 40 to 80 pounds. Mr. Winkle has noticed that the best results are obtained at 80 pounds pressure. No use is made of the waste heat from the kilns. It seems to me that it would be worth doing and would save the live steam at night, though so long as steam piping is used at all it would perhaps not be worth while. I am afraid that for many years I have been almost a crank on this subject, though it is some satisfaction to see that systems of utilizing waste heat, which were not at all common ten years ago, are coming into general use.

—Spray Room—

An interesting part of the plant is the spray room. Spraying terra cotta by compressed air was introduced here a number of years ago, before it was used in any neighboring State, North, East, South or West. The slip or glaze to be applied was at first thrown on by steam pressure, but this was not satisfactory. The principal objection was that the condensation of the steam altered the consistency of the slip, whereupon air was tried. The first air pump was a leather bucket pump; this did not last long; then a type of railway air-brake pump was tried; this did not last long either. Finally an air pressure pump was built by a St. Louis firm and this is in use today. It is found in practice that 90 pounds pressure of steam keeps up 50 pounds pressure of air. Two air reservoirs, or tanks, are used to hold the air. The principal one is near the engine. It is an ordinary steam boiler, 22 feet by 5 feet; the other is a small auxiliary tank in the spray room, to which the nozzles are connected by a few feet of hose. This auxiliary reservoir looks like an upright boiler. It is five feet high and 22 inches in diameter. It serves the important purpose of catching the oil, which invariably creeps in from the air pump. The oil falls to the bottom of the tank and is blown out from time to time by opening a cock at the bottom. It is sufficient to do this every night at the end of the day's work. The spraying nozzles are simple. A tube, tapered to a small orifice, is connected with the air pressure; fitting over this blowpipe is another tube, which is connected with the reservoir of slip or glaze. Nozzles have been used where the slip pipe was in the center and the air came out around it. It appears that not much difference was found, but there is a slight advantage in the air being in the center. It seems to carry the slip out and to atomize it rather better. The slips or glazes are in vats (blungers) on the floors above. In these vats mechanical stirrers keep the solution (slip) in condition by preventing settling.

As to glazed work the quantity of this is proportionately small, though some large contracts in glazed terra cotta have been executed, among which a notable one is at Minneapolis. Glazed work may be of any color desired, white, red, green, black, etc. Most of the glazed terra cotta is used for trims and decorative effects.

—Burning—

The kilns are all muffles. There are fourteen of them and their diameter inside averages 15 feet. Coal is used for fuel. It is the kind known as the "Big Muddy" and is reckoned the best bituminous coal of this State. Seger cones are used in burning, along with ordinary trial pieces. The cones are made at Columbus, Ohio, under the supervision of Prof. E. Orton, Jr. The LeChatelier pyrometer is not in use, though it has been tried on all the kilns and found to be very exact, but it was said to labor under one disadvantage, that when put in one place in a kiln it remained there until the kiln cooled, while Seger cones and trial pieces can be distributed about the kiln. As the heat varies in different parts of a kiln this is an important matter. Large reliance is however still placed upon trial pieces and the burner's judgment.

With regard to the pyrometer, I doubt that the LeChatellier people would agree to the opinion that it has to remain in the place where it is inserted until the kiln cools. I have certainly not had any experience with the LeChatellier, but it is a simple apparatus enough; it is merely a single, thermo-electric element. The electric current produced by the heat is shown by the deflection of a galvanometer, to which the thermo-electric element is connected. There ought not to be any difficulty in taking the fire-clay tube, which answers to the bulb of an ordinary thermometer, out of one part of the kiln and putting it in another part. It is true that this highly refractory tube is said to be somewhat fragile and is expensive to replace. This tube contains the thermo-electric element, formed of two small pieces of wire united at one end. One wire is platinum, the other is the rare metal rhodium. As a matter of course both these metals have very high melting points.

The burning of a kiln of ware averages six days, though it sometimes takes as long as eight days. As they are muffle kilns, no saggers are used, except for floor tiles and this is only for convenience in handling when setting.

—Fitting Room—

The work in the fitting room is of very great importance. Here all the pieces are carefully measured. Corrections are made if necessary, or rejections if any pieces are warped or otherwise defective. This work is so carefully done that very highly skilled labor is not needed for setting in the building. It is only necessary that the man in charge should be able to read a plan. In my photograph of the fitting room may be seen two plans hanging up. These are of two jobs that were in hand. Every piece of a job is marked on its plan and numbered. Each piece of terra cotta bears three sets of indicators; the order number and serial or section number of the piece belonging to a particular job and the setting number, by which the piece is placed in the building. For instance, a piece in the foreground has 2595. A. C. 2 and a "black mark" A. C. 370. All these marks are also on the plan. All the marks on the terra cotta, except the black mark, are impressed in the ware before burning The "black mark" is the one by which the piece is set in the building. It is put on in black paint, except in the case of very dark terra cotta, when white paint is used for distinctness, though it is still called a black mark.

—Drinking Water—

In the summer time iced water is supplied for the 160 hands employed. An average of 450 pounds of ice per day is used to cool the drinking water. The water is always filtered. For this purpose a filter on the plan of the Pasteur filter is supplied by a company in this city. The capacity of the filter is 300 gallons per hour. It contains 15 burned clay filter tubes, each one is 18 inches long and 8 inches in diameter, the hole running through the center of the tube is two inches in diameter. These tubes, after being burned in the kiln, are put in a lathe and ground true outside; the hole through the center is also bored out. This is probably not for the sake of accuracy, but to remove the impermeable skin on the inner and outer surfaces of the tube, which results from firing. The tubes are cleaned by brushing or scraping at regular intervals, the same as for any other filter of this type. While on this matter of filtering it may be mentioned that the water for mixing and tempering the clay is used in the state it comes from the river, but the water for slips and glazes is filtered.

GEO. J. M. ASHBY.

"It takes brains to manage a brick yard successfully; to brains must be added thorough practical knowledge, experience, industry and sobriety."—*R. B. Morrison.*

Written for THE CLAY-WORKER.

THEORY OF DRAFT AND CHIMNEYS.—No. 2.

BY THEO RIZER.

HEIGHT AND AREA.

SINCE THE DAYS of John Smith's modest little brick stack, the chimney has grown to be an important factor in the mechanical arts. This importance is especially marked in the manufacture of clay wares, where the chimney's youthful but potent rival, mechanical draft, has scarcely yet effected a foothold. The wide extent of the chimney's usefulness has forced it upon the attention of scientific men, and during the past forty years many experiments have been carried out with the view of formulating simple and accurate methods of determining chimney dimensions for a given grate area and rate of combustion. The results obtained by these investigations, while highly interesting and valuable, are usually so obscured by the complexity of the mathematical operations involved that few of the chimney users on brick plants have the time or patience to absorb this dry husk of intricate calculation merely for the purpose of securing the kernel of information which it envelops. It was theretofore not intended to indulge in a highly scientific discussion in this series of articles as this would have inevitably landed the writer beyond his depth. It was merely proposed to set forth a few practical suggestions and hints with a brief account of the theory involved which it was hoped might be of benefit to those of the craft who contemplate the erection of chimneys, and who, as previously stated, have had no inclination or opportunity to make a comprehensive study of the subject.

The writer expects the foregoing to serve as an apology—if apologies be needed—to that hypercritical class who are continually demanding something new, though they are seldom or never capable of producing anything new themselves in the line of scientific or practical progress. Their unceasing clamors in this respect, like unto the suggestion of a correspondent to THE CLAY-WORKER a few months ago, that all trade articles should be reviewed by an all-wise censor, starts many trains of thought, all leading if not from the *sublime* to the ridiculous, at least from the *practical* to the ridiculous.

Returning to our subject we have already stated in the previous article that the function of a chimney is to establish a controllable current or flow of air. By regarding such function as separated into two elements or parts we can gain a clearer and more comprehensive idea of the duty a chimney is required to perform in its practical application. These elements may be defined as: 1. The production of a draft or difference of pressure between two defined portions of the atmosphere; and, 2. Capacity for carrying away the obnoxious gases of combustion.

The first is dependent upon the height of the chimney and the difference of the temperature between the escaping gases inside the chimney and the external atmosphere. The capacity of the chimney is dependent directly upon the sectional area and the velocity of the escaping gases; but since the latter varies only as the square root of the height of the chimney, it is obvious that height within practical limits plays a rather unimportant role in securing capacity of outflow. Before attempting to construct a chimney for kiln purposes, it is well to have a reasonably accurate knowledge of the duty required of it. To gain this, some acquaintance with the chemical action of combustion is essential. In a general way it may be stated that combustion is the chemical combination of the oxygen of the air with the carbon and hydrogen of which the fuel is composed. The results of this chemical union are gaseous compounds which must be carried away by means of flues and chimneys. By chemical analysis it has been shown that about 12 pounds, or 150 cubic feet of air at 62 degrees Fahr., are absolutely required for the complete combustion of one pound of average quality of coal. In order to accomplish complete combustion of one pound of coal with this quantity of air conditions must be ideal, and it is usually necessary in practice to allow twice the theoretical quantity, or 300 cubic feet per pound of fuel. Then, if a temperature of 2000 degrees F. is required at the entrance to the draft flues leading from the kiln for the proper solidification of the bricks furthermost from the fire, it is readily calculated by Gay-Lussac's law that for each pound of coal burned on the grate, the chimney must carry away about 1200 cubic feet of gaseous compounds. Therefore, if we have a round down draft kiln of 80,000 capacity having a total grate area of 80 square feet and burning 10 pounds of coal per square foot of grate surface per hour, the chimney and *the flues leading to it* must be designed to carry away 80x10x1200—960,000 cubic feet of waste gases per hour.

After the duty required of the chimney has been ascertained, the next step is to decide upon a suitable height. This is really a very perplexing problem. Theoretically, it would appear that but little draft by the chimney would be needed as all that would seem necessary would be to take away the products of combustion as fast as they were formed. Consequently we could select any height that struck our fancy and then make the sectional area of the chimney sufficiently large to carry away the estimated quantity of waste gases. This mode of reasoning does not, however, take into consideration the frictional resistances to be overcome by the moving gases.

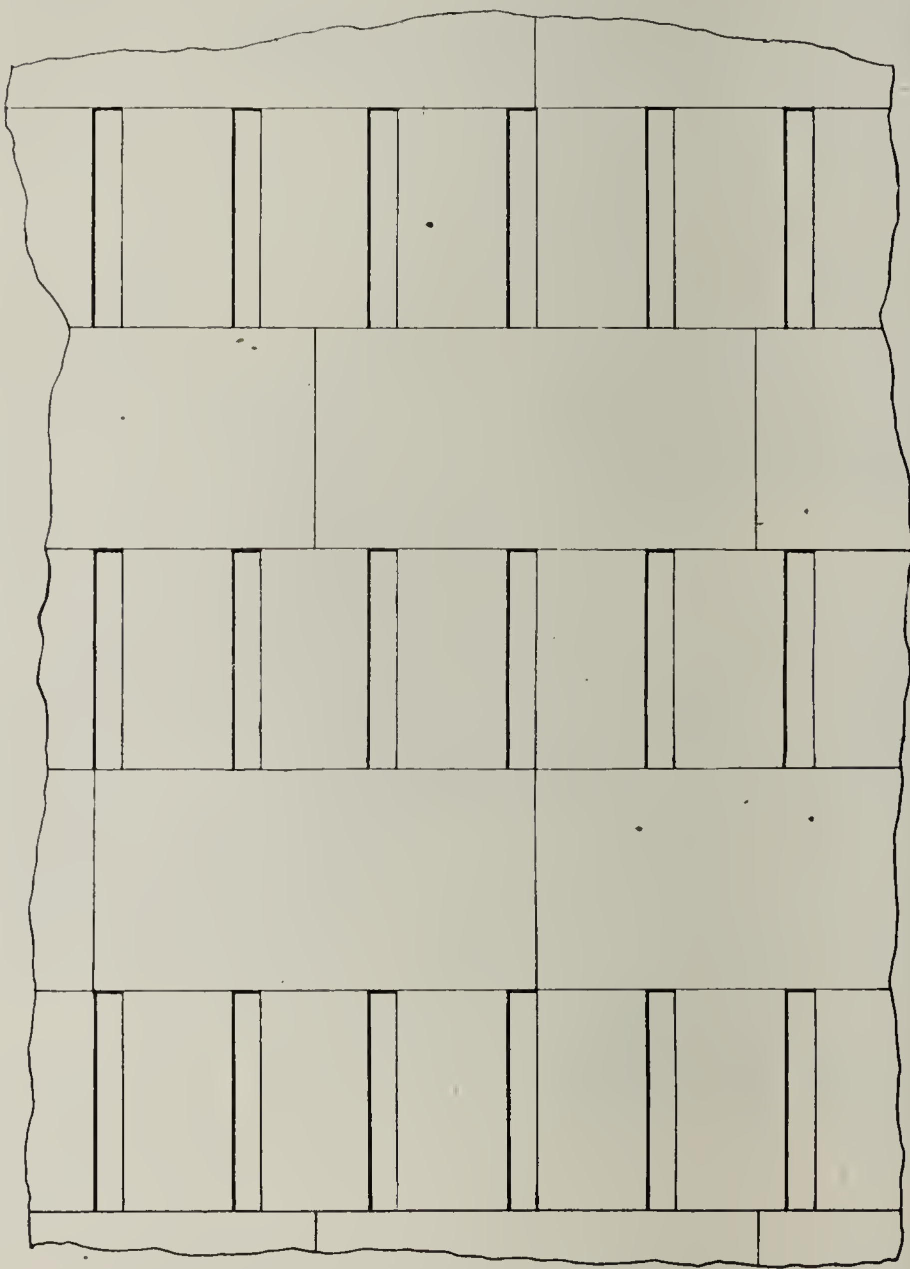


Fig. 5.

Peclet and others have made a careful study of the physical interferences which retard the progress of the outflowing gases; such as friction of the fire bars and fuel bed, friction against the sides of the flues, the loss due to sudden bends, and other sources of obstruction. In table 1 is given an analysis of these various resistances as obtained by Prof. H. B. Gale in a boiler trial.

An examination of this table reveals the fact that a very small percentage of the actual draft power is expended in producing velocity of the moving gases. The balance is consumed in overcoming the frictional resistances. This table, however, gives us little or no clue to the frictional resistances met with by the heated gases in passing through a kiln of brick. From the fact that such resistances vary with the height and closeness of the setting, the directness of the path to the chimney, etc., and that these conditions from the nature of the case can scarcely be brought to anything like uniformity, it can readily be seen how difficult it would be to secure any information on these points which could be of any particular value to the generality of brickmakers.

TABLE I.

	Per cent.
Draft required to produce entrance velocity (36 ft. per sec.)	0.6
Resistance of fire grate	39.5
Resistance of combustion chamber and boiler tubes	53.6
To overcome resistance in horizontal flue	2.6
Discharge velocity (1.2 feet per second)	3.7
Total draft force	100.0

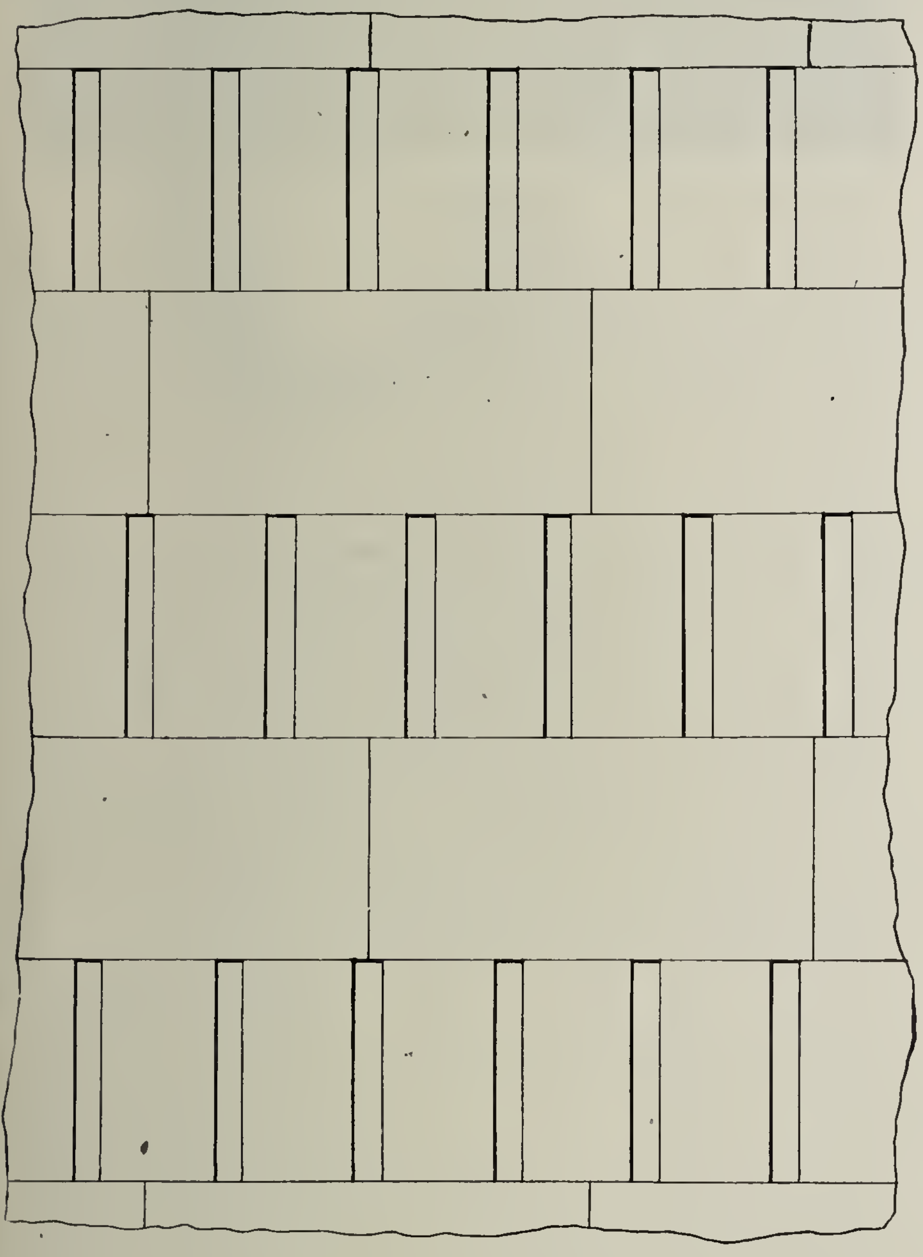


Fig 6.

Some brick manufacturers insist on having the brick set as shown in Fig. 5. As will be seen the spaces between the bricks in each course of headers are directly over the spaces in the next lower header course. This method of setting, if carefully done, will provide a direct path for the gases from the top to the bottom of the setting, and must therefore present considerably less resistance to the movement of the gases than the method shown in Fig. 6, where the bricks in each course are spaced without any regard to the spaces in the other courses. The greater resistance to the passage of the gases in the latter method is obviously due to the extreme tortuousness of the various channels through which these gases must escape, but it is a mooted question if the loss in this way is not more than counterbalanced by the greater proportion of heat absorbed by the bricks, since it is a scientific fact that a flame impinging against a surface will impart a greater percentage of its heat to this surface than if it should merely glide along the same surface.

In the absence of any data dealing with the frictional resistances met with in brick kilns and the impracticability of obtaining data of this kind which would be generally applicable, our only resort is to accept the deductions obtained from boiler trials as approximately true for ordinary down-draft kiln construction. The heights and rates of combustion in Table 2 have been calculated from formulas deduced from the experiments of Isherwood with steam boilers. These figures represent the *maximum* rates of combustion attainable with the given heights. The actual rates of combustion in ordinary practice would probably be considerably less than these.

TABLE II.

Height.	Maximum Rates of Combustion—lbs. per hour per sq. ft. grate surface.				
	Bituminous.		Anthracite.		
	Best Grade.	Low Grade.	Semi.	Best.	Medium.
40	14	19	14	11	9
45	15	20	15	12	9
50	16	21	16	13	9½
55	17	22	17	14	10
65	18	24	18	15	11
80	20	27	20	17	12
100	22	30	22	19	14
120	25	33	25	21	15
150	27	36	27	23	17

TABLE III.

Height of water column in inches, due to unbalanced pressure in chimneys 100 feet high.

Temperature in chimney.	Temperature of external air, degrees Fahr.					
	0°	20°	40°	60°	80°	100°
200°	0.45	0.38	0.32	0.26	0.21	0.16
300°	0 61	0.54	0.48	0.42	0.37	0.32
400°	0 73	0.66	0.60	0.54	0.49	0.44
500°	0.83	0.76	0.70	0.64	0.59	0.53
1000°	1.11	1.04	0.98	0.92	0 87	0.82
1100°	1.15	10.8	1.02	0.96	0.91	0.86
1200°	1.18	1.11	1.05	0.99	0.94	0.89
1300°	1.20	1.13	1.07	1.01	0.96	0.91
1400°	1.23	1.16	1.10	1.04	0.99	0.94
1500°	1.25	1.18	1.12	1.06	1 01	0.96
1600°	1.27	1.20	1.14	1.08	1 03	0.98
1800°	1.30	1.23	1.17	1.11	1.06	1.01
2000°	1.33	1.26	1.20	1.14	1.09	1.04

In table 3 the draft pressures in a chimney 100 feet high have been calculated for various temperatures of the chimney gases and the external air.

Since the draft pressure developed in a chimney is directly proportional to the height if the temperature remains constant, we can readily find the draft pressure in a chimney of any height by simple proportion. Thus, if we wish to find the draft pressure in a chimney 55 feet in height, when the average temperature of the chimney gases is 200 degrees and the temperature of the outside air is 60 degrees. From the table we find the draft pressure in a chimney 100 feet in height for these temperatures is 0.26 inches of water. Then, the draft pressure in the 55-foot chimney is 55.100x0.26—0.143 inches of water.

In Table 4 the theoretical velocities of the chimney gases for various heights of chimneys and differences of temperatures between the waste gases and outside air have been computed. These are the theoretical maximum velocities and are given only as a guide for determining the capacity of chimneys. Anemometer readings taken from working chimneys show that the actual velocities of the gases under the most favorable conditions in practice are seldom or never greater than 50 per cent. of the theoretical velocities, and are frequently not more than 10 per cent. of the calculated velocity. This is due to the frictional resistances previously mentioned, and leads to the inference that these resistances should be diminished as much as possible by making draft flues as straight as constructive reasons will admit and by making the internal surfaces of these flues smooth with a plaster coat of fire clay mixed with a small percentage of salt or silicate of soda. Don't leave underground flues half filled with bats, refuse, and heaped-up rubbish. In our next we will discuss some points on the construction of chimneys.

TABLE IV.

Theoretical Velocity of Chimney Gases, Feet per Second.

Height of Chimney in Feet.	Average Difference of Temperature of Chimney Gases and External Air.									
	100°	200°	300°	500°	1000°	1200°	1400°	1600°	1800°	2000°
40	23	32	40	52	73	80	86	92	98	103
45	24	34	42	55	77	85	91	98	104	109
50	26	36	45	58	82	90	96	103	109	116
55	27	38	47	60	85	94	101	108	115	120
65	29	42	51	66	93	102	110	118	124	132
80	32	46	56	73	103	112	121	130	139	146
100	36	51	63	82	116	126	136	146	154	164
120	40	56	69	90	126	139	149	160	169	180
150	45	63	78	100	141	156	167	180	189	200

Written for THE CLAY-WORKER.

PHILADELPHIA BRICK PLANTS.

Two Disastrous Fires.

THE GENERAL BUSINESS of the yards is now in full swing. Operators and workmen are keeping well together and material men and contractors are hopeful that the season will go through without any of the nerve-racking and moral-destroying influences of a strike.

The general outlook is good, several large operations getting under way. The John Wanamaker department store, at Thirteenth and Chestnut, running through to Market and Juniper streets, has already been started, and this alone will take upwards of eight million brick. And to this we can tack on many real estate operations, running into the thousands, of two and three-story dwelling houses.

While over in Kensington, treading the dust and watching a kiln being burned, word came over the 'phone of a big fire at one of the yards near Chestnut Hill.

A Glimpse of T. B. McAvoy's Sons' Plant.

FIRE AT H. G. COLLOM'S, GERMANTOWN.

Hastening over as fast as trolley and train could carry us, I came across Mr. Collom, within half a mile of the plant, hurrying along on special business. Drawing rein, he halted long enough to receive my regrets. In a cheery way he said: "It isn't quite as bad as it might have been; we saved the kilns and the office, but beyond that everything is wiped out.

"The fire broke out last night, the 22d, between 8 and 9 o'clock, when Phil Ludwig was making his rounds, and I guess it broke out near the machine shed. The alarm was turned in to the fire companies of Manayunk and Chestnut Hill, but between their tardy arrival and the scant supply of water the flames had eaten into and communicated with the boiler house, the machine and engine house, and before midnight was wrecking the fan shed and auxiliary engine shed, dynamo and thence to the tunnel dryer. But go up and help yourself; you'll find a nice mess."

Loading up From Kiln at Alex. McAvoy's Yard.

Sure enough! There as I planted the camera was a picturesque display of black and charred ruins of what had always been conceded to be the trimmest yard and plant in this section. The good old steadfast Martin machine, rusted and bent, was lying on its side, "down and out" for good. All that was left of the trim boiler house was the two 80 H. P. Wetherall boilers and the 50-foot smokestack, a black mass—just food for the camera.

Between this and the tunnel dryer the Martin pug mill and crusher, and on the right the 15x30 Wilbraham engine and the 50 H. P. Erie engine, located in the fan house and used in running the dynamo and fan, was nothing but a tortured mass of rust and smoke-begrimed masses of iron and steel.

Crossing over between the boilers and the dynamo, my wooden-legged companion and I moved with careful footsteps in and along the track to the tunnel dryer. Here the trucks were being brought out and examined as to their future use, black-faced men moving to and fro with loads of charred pallets, stacking same ready for the inspection of the insurance adjusters. Nothing remained intact but the five kilns and a half million reserve brick, stacked for immediate shipment. So far the fire had taken all that was best on the space of 1½ acres, leaving damage behind to the extent of $25,000.

In 1898 Mr. Collom suffered from fire, and, profiting by his loss, carried during those six years over $30,000 insurance. Last December, however, the agents advised him that they would raise him $50 per thousand, and he, in vulgar parlance, "kicked" and replied by cutting down his insurance some $10,000.

No direct cause can be given for the fire. Mr. Collom is generally philosophical and says he will pull through and in a couple of months will have everything in shipshape order again.

A small fire also broke out the same night in the fancy brick and pottery concern of J. E. Jeffords, at Salmon street, above Lehigh avenue. This spread to the molding shed and modelling shops, causing damage to the extent of $2,000.

T. B. M'AVOY'S SONS—ALEC. M'AVOY'S BUSY YARD AT KENSINGTON.

Out there on the suburban edges, this busy yard controls a section that fairly teems with orders for hard, straight hard stretcher and paving brick. During the year 1903 Alec. McAvoy toiled and sweated over his councilmanic duties and his brick yard. From the latter he managed to get out between nine and ten million; what he got in from the former I wouldn't like to venture.

He continued running until the 5th of January of this year; orders came in and so did the frost, until it struck a three-foot depth and the men were compelled to lay by. Along towards the third week in February orders came, and peremptory, so a double force had to be put to work on the clay bank, and only by wedging and other hard ways of doing were they successful in breaking it up. Then came a period when, failing to receive their coal supply, the five kilns were compelled to remain idle. Since March 1, however, they have burned twelve kilns, and as I entered a salvo of smoke and dust greeted my nostrils, and the camera took in the rest.

Factories are growing up all around here, like unto mushrooms, and two and three-story dwellings that likewise soak up bricks as a sponge takes up water. In addition extensive sewer work, hungry always for the plant's output, yields unto the yard a good income.

Hard are fetching	$ 8.50
Straight hard	10.00
Stretcher	11.00
Paving brick	$12.00 and 13.00

Alec. McAvoy is at present feeding a large factory at G and Ontario streets, the new sewer works on Main or Fifth and York streets. Also the Quaker City Rubber Works, with an order for immediate delivery of over one million. The Tunnel Blue Works also demand two hundred thousand, and these short haulings mean long profits. Over at Broad and Wallace streets the big warehouse for Snellenburgs will engage Alec's attention for some time to come. He is now making as an auxiliary a new round-corner brick. So the St. Louis fair won't see him yet a while.

FIRE AT WEBSTER & KEYSER'S PLANT AT THIRTIETH AND TASKER STS.

The alarm rang out on the morning of the 15th, just as the night watchman had completed his rounds, and from a small blaze in the boiler house the head wind caught and twisted it until the flames fastened themselves on the engine house, machine shed, the dryer and the mill shed. Here, fortunately, the conjunction of flames became so fierce that the two 3,000-gallon tanks located over the machine roof fell with a crash, thus flooding and saving the machinery. Notwithstanding the efforts of the men and firemen, the flames crept in and around the vital parts, and in a short time all the belts were destroyed and in the place of a cleaned-up yard, ready for the long-expected spring trade, all became a mass of charred wood and scrap, leaving behind a loss of over $4,000.

Mr. and Mrs. Keyser were "ozoning" at Atlantic City, and, while the fire broke out on Friday and a dispatch was immediately sent to him, he did not receive it until Sunday. Oh, we're quick sometimes in Quaker City!

The only cause that can be assigned for the fire is that the roofers had been pitching the roof of the boiler shed the previous afternoon and presumably it leaked through and dropped down on the boiler. The watchman pulled his damper, pulled his whistle-cord, and if he had but pulled his steam valve all would have been saved—but, of course, a caught ball saves a long chase; and there was nothing else to do but to patch up, get out the horse and go back to the old tempering pits and thank the gods it wasn't worse.

The Hercules machine, however, stands O. K.

DEATH OF CHARLES H. REEVES.

I regret to report, in closing, the death of Mr. Charles H. Reeves, a civil war veteran and founder of the Master Builders' Exchange. His death, due to heart failure, occurred on the night of the 5th at his home, No. 3032 North Park avenue.

Mr. Reeves was born in the old Spring Garden district on March 11, 1839. After attending the public schools, he was apprenticed to his father to learn the plastering trade. At the outbreak of the war in '61 he served with the Thirty-second Pennsylvania Volunteers, and at its close resumed active business life again. He joined the Master Plasterers' Company in 1864. Mr. Reeves's father died in 1871 and the firm name changed to J. W. & C. H. Reeves.

Later he founded the Master Builders' Exchange, and became in turn Treasurer and President of this healthy association. As monuments of his strenuous life he leaves behind many buildings designed and executed by him. Among them the United States Supreme Court, in the City Hall, the big bank of the Drexels, the Northern Liberties, Tradesmen and others, Swarthmore College, and some of the Centennial buildings.

Ruins of A. G. Collom's Plant, Germantown.

To all the brickmen he was ever courteous and always ready to lend the willing hand.

W. P. L.

Written for The Clay-Worker.

CLAY DUST—No. 11.

By A. Lumina.

Natural vs. Artifiial Drying for Small Plants.

"What is the smallest soft mud output that will warrant artificial drying where racks and pallets are already in use and in good condition?"

PROBABLY NO QUESTION is of more vital interest to a large number of brickmakers than the one stated above, which has come to me through The Clay-Worker, whether the last clause be considered or not. This question has been brought before our Conventions, National and State, several times, but has never been discussed in a satisfactory manner. In reviewing the work of the Boston Convention I had something to say upon this matter and advised a full presentation of all the facts and conditions of a special, concrete case, and that a competent man be given ample time to prepare a discussion upon it. As there seems to be no immediate probability of such a treatment of this question, and as it is one that small manufacturers of brick are considering at this time, I will endeavor to bring out, in answering this inquirer, the salient points that should govern action in such cases. In order to do this I will have to assume certain definite premises that are not given in the above statement of the question. It is evident that the "smallest output that will warrant artificial drying" must depend upon many more conditions than that "racks and pallets are already in use and in good condition."

In this discussion it will be assumed that the cost of drying a thousand bricks, per se, is greater by any system of artificial drying than by natural drying. There may be under usual conditions, a small saving by artificial drying in the cost of handling the brick, and there is of course a saving of time and the advantages of steady, continuous operation, but no one familiar with the amount of heat required to evaporate water would contend that the cost of drying itself is not greater with the artificial than with the natural dryer.

We will also assume that sufficient capital for the increased investment can be obtained, and that the only question to be decided is whether the saving in time and the increased yearly output effected by the artificial dryer will yield a satisfactory return upon the money required for its installation. This depends upon the answers that can be given to the following questions:

1. How many brick can be profitably marketed in the year?
2. How many days in the average year can brick be well dried in the open air?
3. What are the drying qualities of the clay?
4. What would be the cost of the artificial dryer proposed?
5. What would be the cost of a modern, permanent natural dryer?
6. What would be the cost of operating the natural dryer?
7. What would be the cost of operating the artificial dryer?

First. One of the advantages of the artificial dryer is, that without increasing the equipment or the working force, a larger quantity of brick can be made in the year, since the brick can be dried almost equally well in wet weather and the season of making can be considerably lengthened. But if the demand for brick is small, and can be supplied with the open air drying, it would be unwise to invest in an artificial dryer. If, on the other hand, a million more bricks could be sold each year, and this additional output could be secured by an artificial dryer, the question of the wisdom of such an investment can be easily calculated.

Second. This question of natural vs. artificial drying is often governed by the latitude and climate, or prevailing weather conditions. Whether a brick plant should have an artificial dryer may depend upon whether it is located in Western Oregon or Washington, or in Southern California, in Minnesota or in Texas, in Maine or in Georgia. The output of a yard with a given equipment, by natural drying must depend upon the number of days in a year that such plant can be operated, and knowing this, the additional output that could be secured by artificial drying can be calculated.

Third. The behavior of the clay in drying may of itself settle the question of artificial drying. There are some clays so tender that natural drying must be done so carefully as to require large area of sheds to protect the brick from wind and sun. With such clays, an artificial dryer, if properly designed and constructed, could dry the brick in much less time and with less damage from checking, and without so much additional investment over the natural dryer. It is safe to calculate that any clay that can be dried in the open air, in racks or under sheds, can be dried quicker and with less damage in an artificial dryer adapted to the clays. There are some cases, however, as on the Hudson river, where the clays are so weak and sandy that they will not stand handling as they come from the machine and must be taken to the drying ground in the molds. The only artificial dryer that would be practicable in such cases is the hot floor dryer.

Fourth. It is obvious that in order to calculate whether the proposed artificial dryer would be a profitable investment we must know the cost of such a dryer. There are several forms of artificial dryers that could be built, and the cost of these varies greatly even under the same conditions. Some of these dryers would be impracticable for small plants by reason of their great cost, while some less costly form of artificial dryer would be permissible and profitable. Thus whether the output or other conditions would warrant artificial drying may depend upon the kind of dryer proposed, its cost and its capacity. The artificial dryer calculated in this discussion is the best fireproof construction, capable of the most economical operation.

Fifth. If a new plant is to be built the cost of both the natural and artificial dryer must be figured, so as to see how much larger the investment would be for the latter than for the former. By the natural dryer I mean permanent wood sheds, with roofs capable of instant opening or closing, and in these sheds trestles or racks for holding bricks transported in large units, on trucks or cars, and which can be taken out when dry in the same manner. By this system the cost of handling the brick is practically the same with the natural as with the artificial dryer.

Sixth. In order to determine whether in any given case the natural or the artificial dryer would be the more practical we must also estimate the cost of drying by each method. The cost of drying by natural means, as usually operated, is the cost of handling and transporting the brick. But I have assumed, in order to make a fair comparison of the two systems, that the most modern and labor-saving methods be adopted in either case, and hence that the cost of handling and transporting the brick would be practically the same whether the natural or the artificial dryer be used.

Seventh. In calculating the cost of artificial drying I have assumed that the waste heat from cooling kilns would not be available, for the reason that upon most of such small-capacity plants for making common brick the open-top clamp kiln would be used. I do not mean by this that it is impossible to utilize the heat from up-draft kilns for drying, but that no practical method of doing this has yet come into general use. Moreover, I do not mean to declare that the up-draft kiln is the only practical kiln for such yards, but it is the kind of kiln usually found.

The profit of an artificial dryer comes from the following sources:

First. Larger yearly production with same equipment.

Second. More rapid production and a steadier output, hence ability to fill contracts promptly, which should mean increased profits.

Third. Freedom from loss by storms or from freezing weather.

Fourth. Increased length of season of manufacturing and steady operation secures better workmen, which should mean a lessened cost of production.

Fifth. Greater peace of mind to proprietors and a more satisfactory business.

The only one of these items that can be accurately calculated in dollars and cents is the first, and I base my estimates in the following table upon this alone. I assume that under different climatic conditions the plant with natural dryer could be run 150, 175 or 200 days in the year.

I estimate the cost of artificial drying at 25 cents per thousand brick, and reckon the brick as selling for $1.75 per thousand more than the cost of manufacturing when dried by natural means, and $1.50 per thousand when dried by artificial means. I have also estimated the charges against the artificial dryer for interest, taxes, repairs and depreciation at 15 per cent. of the cost of this artificial dryer over the natural dryer.

	Daily capacity.	No. days running by natural drying.	No. days running by artificial drying.	Yearly output by natural drying.	Yearly output by artificial drying.	Increased output by artificial drying.	Yearly profit on increased output.	Cost of artificial dryer over natural dryer.	Interest, taxes, repairs and depreciation on artificial dryer.
A	30,000	150	225	4,500,000	6,750,000	2,250,000	$2,250 00	$6,000	$900
B	“	175	250	5.250,000	7,500,000	“	2,062.50	“	“
C	“	200	275	6,000,000	8,250,000	“	1,875.00	“	“
D	25,000	150	225	3,750,000	5,625,000	1,875,000	1,875.00	5,000	750
E	“	175	250	4,375,000	6,250,000	“	1,722.75	“	“
F	“	200	275	5,000,000	6,875,000	“	1,562 50	“	“
G	20,000	150	225	3,000,000	4,500,000	1,500,000	1,500.00	4,000	600
H	“	175	250	3,500,000	5,000,000	“	1,375 00	“	“
I	“	200	275	4,000,000	5,500,000	“	1,250.00	“	“
J	15,000	150	225	2,250,000	3,375,000	1,125,000	1,125.00	3,500	525
K	“	175	250	2,625,000	3,750,000	“	1,031.25	“	“
L	“	200	275	3,000,000	4,125,000	“	937.50	“	“
M	30,000	150	200	4,500,000	6,000,000	1,500,000	1,125.00	6,000	900
N	“	175	225	5,250,000	6,750,000	“	937 50	“	“
O	“	200	250	6,000,000	7,500,000	“	750 00	“	“
P	25,000	150	200	3,750,000	5,000,000	1,250,000	937.50	5,000	750
Q	“	175	225	4 375,000	5,625,000	“	781 25	“	“
R	“	200	250	5,000,000	6,250,000	“	625.00	“	“
S	20,000	150	200	3,000,000	4,000,000	1,000,000	750.00	4.000	600
T	“	175	225	3,500,000	4,500,000	“	625.00	“	“
U	“	200	250	4,000,000	5,000,000	“	500 00	“	“
V	15,000	150	200	2,250,000	3,000,000	750,000	562.50	3,500	525
W	“	175	225	2,625,000	3,375,000	“	468.75	“	“
X	“	200	250	3,000,000	3,750,000	“	375 00	“	“

—Summary—

First. If the small plant with natural dryer can be operated long enough in the year to make all the brick the market will consume, it would not be profitable to invest in an artificial dryer.

Second. If a larger output is desired and could be sold at a profit, the questions that govern the practicability of the artificial dryer are the quantity of brick made per day, the number of days in the year that the plant could be operated with a natural dryer and the additional number of davs that the plant could be operated with an artificial dryer.

Third. If the plnat by artificial drying could be operated seventy-five days a year, the artificial dryer would be a profitable investment whatever the other conditions may be.

Fourth. If the plant by artificial drying could be operated only fifty additional days a year, the artificial dryer would be a profitable investment.

(a). With a plant making 20,000 to 30,000 brick a day when the plant could be operated by natural drying less than 200 days in the year.

(b). With a plant making 15,000 brick a day only when the plant could be operated by natural drying not more than 150 days in the year.

These conclusions are from the assumed conditions, but will give a basis for calculations under any conditions. The cost of artificial drying has been placed lower than is possible under ordinary conditions, except where exhaust steam, or other waste heat is used. On the other hand in general practice some cost of handling must be charged up to natural drying. So it is considered that the above exposition of the matter is fairly reliable.

It is assumed that the drying in artificial dryer can be done in thirty-six hours, though the dryer figured upon is built large enough to hold two days' run of brick.

If the brick are dried by natural means upon the ground or with the cheapest form of racks, the cost of the artificial dryer above the cost of such a simple drying ground would be greater than that given in the table. On the other hand a simpler form of artificial dryer could be constructed for small outputs that would cost considerably less than the one figured upon in the table.

This question is just as practical where the stiff mud process is employed as where soft-mud brick are made. In either case the brick can be handled in large units, for natural or for artificial drying. When, of course, the yard has already been equipped for natural drying it must mean quite a large loss of a previous investment, but this should not deter a manufacturer from making the change if it can be shown that the artificial dryer would yield sufficiently large returns in increased earnings to pay a good interest upon the investment.

Written for THE CLAY-WORKER.

POTTERY AT ST. LOUIS FAIR.

Government Display of Rare Interest.

THE NATIONAL MUSEUM will have at St. Louis the finest exhibit of aboriginal pottery ever shown in this country, and the exhibit will be made in a most unique manner, not heretofore attempted.

In pursuit of information in this particular the writer called upon Dr. Walter Hough, assistant curator of the museum's department of anthropology, and one who has lived among the Indians, studying their home life and ceremonial customs, witnessing their wierd dances, in one of which, the snake dance, live rattlers are held in the mouths of the performers, and exploring with their assistance ancient pueblos, burial mounds, etc.

Many of the beautiful specimens of pottery that will be seen at the St. Louis Fair will be those collected by Dr. Hough while on exploring expeditions. During the last of the latter over 55 ruins were visited, and 18 of these were excavated in a region nearly 200 miles north and south by 70 miles east and west; Hopi, Navaho and Apache Indians were visited, and 2,500 specimens, including, of course, much pottery, were found. Some of the ruins visited were of great dimensions, one at Forestdale, Arizona, having, before its decay, about 1,000 rooms.

Many of those who will look upon the aboriginal American pottery at St. Louis may not know that that interesting ware was, in most instances, made by women. But such is the fact. Centuries ago dusky maids and matrons toiled over these bowls, vases, etc. (the writer was shown by Dr. Hough exquisite specimens between 500 and 700 years old), and, considering the few crude tools used and facilities for baking, the skill of the female aboriginal potter was wonderful. Here is a description by Dr. Hough of the process followed by the red woman artist:

"The potter has lavished on this object (a double red bowl, decorated with geometric designs in black enamel) her highest skill, and the result is an achievement in polychrome ware which probably marks the highest attainment in ceramic art from the

Excavating for Pottery, etc., Jettyto Valley, Ariz.

Southwest. The potter formed two bowls of selected clay and joined them while 'green' by a short neck connecting the rims. She then washed the vessel with fine yellow ocher and finished the surface with a smoothing stone. Having prepared her pigment for the black enamel, the basis of which is iron ore—but the secret of its mixing, whether with alkaline salts or resin, is lost—she skillfully laid on the interior of one of the bowls a geometric design and on the exterior rims of both various geometric frets, outlining the latter design with stripes of pure kaolin. The interior of the second bowl required the preparation of a second color which should burn to soft gray and melt into the background. The vessel was then fired. The result shows a knowledge on the part of the potter of materials, manipulations and processes, from the selection of the clay to the last stage of firing, and a highly developed artistic sense in form and color that command our respect and admiration."

Some Pieces of Gray Ware on Exhibition at World's Fair.

The exhibition of aboriginal pottery at St. Louis will be in a series of shelved cases, around which will be placed panels containing symbolical paintings, such as are employed by the Indians in their decorative art. The Moki, Zuni, Alaska and British Columbia Indians are the ones to be particularly represented in the exhibit.

Dr. Hough says on this subject: "Nowhere on this continent is there found a greater wealth of symbolism than in the region of the Hopi mesas, among the living as well as among the dead. The expression of this symbolism is also of an interesting stage, that of transition from the realistic to the idealistic, and various degrees of growth exhibiting examples of the origin of symbols and their submergence into conventional and geometric forms. The beginning, range and decay of symbols, as well as the subjects involved, form a fascinating chapter in the history of this region, a history that gives, beyond all in importance, a clew to the thoughts of the pueblo dwellers."

Did the red woman artist think, when she was painting designs on pottery, that she was thus making historical records for posterity?

Written for THE CLAY-WORKER.

BUTTON-HOLE TALKS.

WOODEN INDIAN MORALS.

IT MUST BE THAT I was in a brown study, though why a study should be denominated brown I know not. Possibly, as a matter of fact, more of my studies are blue than brown. However that may be, I started suddenly at his touch, for so many of the recent touches had been serious and has possibly weakened me and left me nervous. Anyway, I started, and, for that matter, so did he.

"Seems to me I read something of yours once about the environment's making the man. Wonder if you really think it does?" While his touch started me, this indeed startled me. I had never for a moment supposed that any one really read the things I wrote, and yet here was a man boldly, aggressively saying he had. So I was not only startled, but afraid. What would he do to me, or rather, what wouldn't he do? But he continued: "So you think the man's environment makes him, do you? That the where he is makes the what he is? Well, it may have a whole lot to do with it in some cases, but it certainly isn't the whole proposition. Convent walls won't shut thoughts in or out, and pretty faces and recollections will float into hermit caves and cloister cells on the wings of thought, and bars and locks will not hinder or shut them out. At the Easter service, with soft religious light falling through stained windows, with surpliced choir, with eloquent rector, think you the sermon or the bonnets get the most earnest attention?

"There are examples of the purest of white in the midst of the darkest stain and of the blackest of the black in the front seats of the synagogue. More depends on the material than on the environments, anyway. If the seed is no good, no matter how good the soil, there will be no harvest, and thistles and "come-along burrs" grow the more luxuriantly in a fertile garden, just as a really devilish nature grows worse in an atmosphere of civilization and culture than in a squalid alley or a cannibal island. However, if there isn't anything in the candidate, then there's nothing for the surroundings to operate on.

"I saw a man this morning who has made it a practice, to my certain knowledge, to stand at the edge of the sidewalk, in the slum, year after year for many years. Jostled by the vilest of the vile, continually within the sound of ribald jest and song, he has remained untouched and uninfluenced by all his surroundings during all these years, unless it be for a slight cracking of the paint, for this sinless individual is a wooden Indian cigar sign. Without doubt the most sinless citizen of this district, and yet always in the path of temptation, he stands untouched, where his brother in flesh and blood goes down in wreck, because, while he has the outward form, he hasn't the "works" inside. There's nothing inside to take fire and glow and burn, to clench the wooden hands and nerve the wooden feet and direct them into paths they should or should not follow. There's no grey matter in that wooden head to yield instant answer as to what is right and what is wrong, and then as quickly to force the knotted fists to unclinch and those stubborn feet to turn right about into the other path. And possibly, just as the wooden Indian is entitled to no credit as to resisting temptation, so the wooden man is entitled to no more, for temptations surely do not affect all alike, and what is an awful, absorbing, binding, controlling temptation to one may be abhorent to another.

"We can all see the mote in our brother's eye much better than the beam in our own, the things near better than those afar off, and in our quick condemnation of our neighbor's weakness we do not often stop to put ourselves in his place and note all the surrounding influences. No man can read accurately the passing thoughts of those he meets, and God help him if he could, for what a sorry mess of littleness and selfishness and little selfishness there would be to make him despise his kind! How God can see them and not repeat Sodom and Gomorrah is a wonder.

"But possibly as it was there, it may be here, and there is the saving element, and where there is good it is so glorious; not the passive good of the graven image, but the pulsating, throbbing, strong, living, acting *human* good, that is good in spite of its ability to be bad, and indeed of its wanting to and knowing how to be bad and of having the opportunity."

His fingers slipped out of the button-hole and he was gone. He had no clerical collar, it wasn't Sunday and we were not in a church; what right had he preaching to me, anyway?

GATES.

Written for THE CLAY-WORKER.

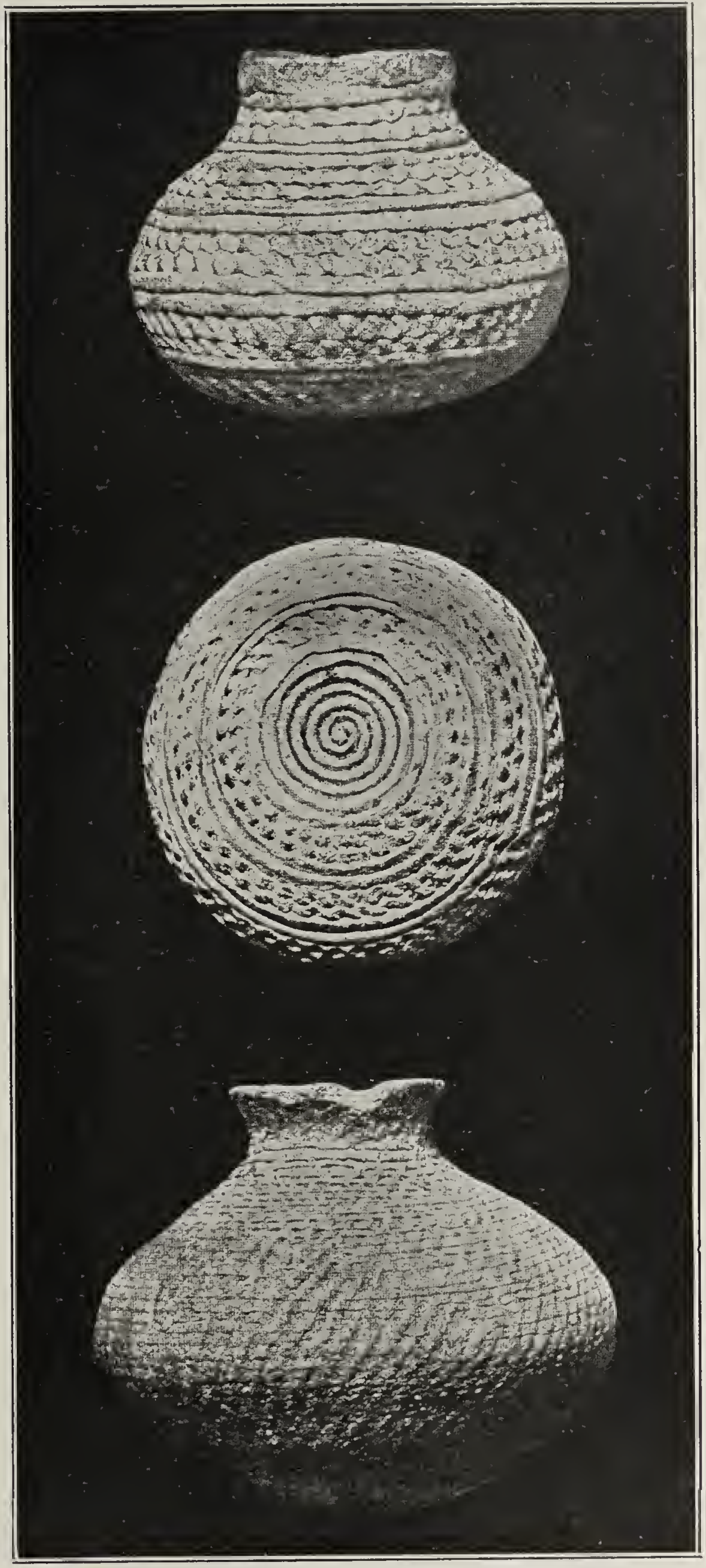
THE OUTLOOK.

[FIRST PAPER.]

FORECASTING FUTURE events seems to be a favorite pastime with all sorts and conditions of men. It is easy to find the man who can tell all that is to happen in the next decade, from weather changes to the elections of presidents. Every village and hamlet has its prophet who, though he may from sheer modesty have failed to publish the fact in advance, is sure to remind you after the occurrence of any wonderful event, that he had told you so, or that he had a premonition of its coming. This class of individuals seldom do much to hasten the coming of any event either great or small, good or ill, but simply wish to be held in esteem for their wonderful foresight, and hold all mankind responsible for the disasters that come upon this world because of the failure to appreciate their genius. The politician is somewhat different from the above class in that he predicts everything in his favor prior to election day, works like mad to make his predictions come true, but often after election is forced to own up that he knew all of the time that he was fighting against odds too great for man to overcome, or that brains and honesty have no chance against boodle and corruption. Still, after a signal defeat, with hands still red with political gore, he is ready to predict "We will whip them the next time." The elasticity of a defeated candidate ought to be a stimulating object lesson to the business man who is trying to patch up a shattered fortune.

From force of training, the preacher is a prophet. Not that he will attempt to tell you the times and seasons of coming events, but that an all powerful Creator will, out of this tangled web of good and ill, bring to pass that which is best for all. He would stand on the bloodiest field of battle and amid carnage and death, predict that good would come of it. He can see God in everything, hence good in anything. And I believe the preacher is right. Not that all things are good, but that out of it all, in spite of envy, jealousy, selfishness, greed and robbery, the highest good will be developed.

Somewhat akin to the preacher's faith, yet differing widely, is the faith of the business man who invests his all in a venture that will either bring him to want and penury, or else fill his barns with corn and abundance. The business man must of necessity believe in the stability of our institutions and that good results are to be obtained from legitimate investments. He reasons that the world has always used certain staple articles of food, dress, ornaments and structural materials, and that they will continue to do so to the end of time. Fashions may change, governments be dissolved, famine and pestilence may come, still people must eat, drink and protect themselves from climatic changes. These misfortunes may lessen the consumption for a time, but soon the world swings back to its old situation and normal conditions must obtain. Not only this, but the luxuries and curiosities of one age become staple necessities of the age that follows, and the business man sees therein new opportunities of investments that are just as safe from a financial standpoint as



Specimens of Indian Coiled Ware.

to purchase corn, houses or lands. It is in these new investments that the successful business man shows the keenness of foresight that almost resembles prophecy.

During the last quarter century we have been so often surprised at the success of gigantic business ventures into new fields which we at first believed could but result in failure, that we have ceased to wonder and now naturally expect success whenever American brains, capital and energy combine, no matter how impossible the attempt may seem to be. Yet this is not the work of a wizard. Business men keep in such close touch with the people that they know when the time is ripe to push a scheme, and they can figure to a nicety the results from this or that enterprise. They know what we need before we know it ourselves. So they build railroads, canals, tunnels and factories. We patronize them and make them a success. And then we wonder how we ever managed to do without them in times past. We change our business methods to be in harmony with these new productions, and in a few years these things that only a short time ago seemed but idle curiosities, have become necessities second only to food, clothing and homes.

But the wisest of mariners do not have all smooth sailing, and the best laid plans of the most experienced business men sometimes come to naught. There are unforseen rocks and tempests in the commercial sea as well as in the literal ocean that claim many a noble craft. It requires bravery to enter upon a cruise in unknown waters, and even the best may find his skill and experience will not avail to bring his boat to harbor. Some men are intimidated by other men's failures, while others use these as charts to guide them to a successful issue. But, what of the present outlook? What are the chances for fair sailing and good profits at the beginning of the year 1904? What are the signs of general prosperity and the prosperity of brickmakers in particular? Do we find the situation altogether to our liking, or are there some hard rows to be hoed in our field? Suppose we take a look at this matter from some sensible standpoint and see what is in sight, and also discuss some points that are hidden from human ken.

Matters seldom come out just as we expect them, for not often does our hen hatch all her eggs, and even if she should have such good luck, not all of the chicks would reach the market. Let us try to make due allowance for such mishaps, and then figure out if we can what there is probably in store for the brickmaker during the coming year. It will not be all guesswork. There is much in plain sight if we would only open our eyes and take a view of the situation. Causes are at work that must produce certain results. But there may be causes operating for or against our prosperity of which we can now see nothing. These are the obstacles that have brought to naught many a well laid plan which under ordinary conditions would have surely succeeded. So if we chance to miss our guess for this year, please excuse us on the grounds that the Yankee blood in our veins is responsible for the spell that now forces us to risk our reputation for good judgment in writing the few articles that are to follow this. L. C. Moore.

A Great Deal of Help.

Editor Clay-Worker:

Inclosed find check for $2 as payment for this year's subscription of The Clay-Worker, which I have enjoyed reading and which has been a great deal of help to me in the last thirteen years in the brickmaking business. It gives we country fellows a lot of new ideas and subjects to think about. Trade prospects for following season are bright. We have only a small country yard and turn out about 750,000 brick a season, which are all sold in small quantities to country trade, the demand being for all hard brick generally. L. T. Buck.

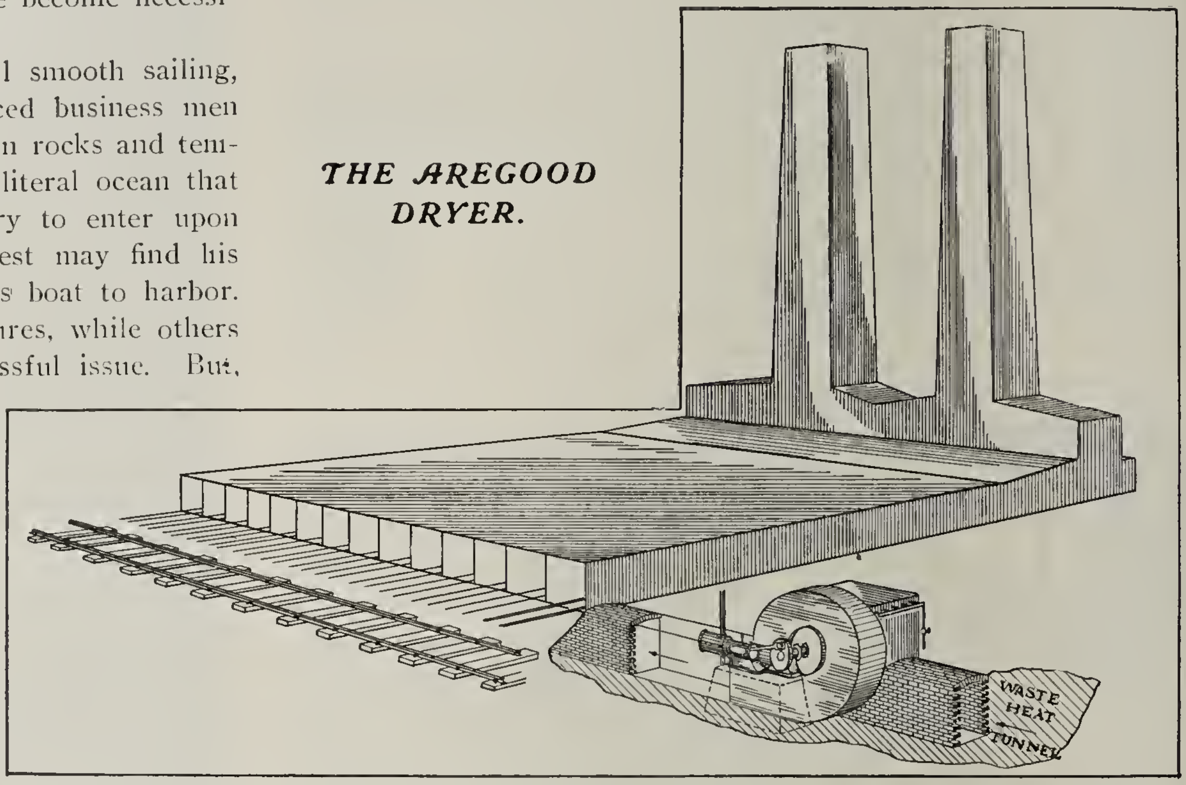
Weems, Va.

THE AREGOOD DRYER.

Mr. John Aregood, not being satisfied with inventing a very economical dryer in itself, has made numereous improvements in the way of supplying the necessary heat for it, and with his completed system uses every particle of heat otherwise wasted by the plant to the profitable advantage of drying. His system uses heat from the cooling kilns, from the boiler plant, and uses exhaust steam without in any way reducing the capacity of boilers or engines.

With his economical dryer it has been demonstrated that enough heat is wasted in nearly every plant to supply the demand for drying the entire output, reducing the cost of drying to practically nothing.

As it became necessary to construct and install these plants as well as design them, The Aregood Construction Co. has been organized, succeeding The Aregood Dryer Co., with F. E. Woodford their chief engineer. Mr. Woodford is a civil and mechanical engineer having had a large experience in structural work and machinery of all kinds himself, being the inventor of several heat generating and distributing devices. With his experience in engineering work in general, the building of the Aregood system becomes a guraranteed success in the economical drying of clay products.


THE AREGOOD DRYER.

FAMOUS DELFT POTTERY AT THE WORLD'S FAIR.

Mr. A. Labouchere, proprietor of the famous Delft Ware Pottery of Joost Throoft & Labouchere, at Delft, Holland, writes Dr. J. Perry Worden, of the High School, that, although unable to secure the space desired, and thus compelled to limit the scope of their exhibit, their display will still be very fine. It will have a unique phase to it, insofar as it will be a joint display with that of their friendly rival, the famous Rosenburg pottery. Joost Throoft & Labouchere's Pottery of the Porcelain Bottle, which was founded at Delft in 1873, has been famous for centuries as a producer of blue and polychrome earthenware art nowhere successfully but everywhere miserably imitated, while the Rosenburg's have a history about as old and a present status about as eminent as the American Rookwood. But both establishments compete on the most honorable terms, never copying each other's models, and at the coming World's Fair both will be housed in the Varied Industries Building, in a single booth of two compartments designed by the eminent Dutch artist and art adviser of the Delft Pottery, Mr. A. Le Conte. The exhibits include many of the choicest, masterpieces removed from the potteries' ovens this winter and will assuredly surpass both those of Chicago and those at Paris, all of which won high praise. Delft ware has always been a favorite in America, and the quaint old town of Delft in Holland is one of the first goals for the art-seeking American abroad. It is very much to be regretted that

Mr. Labouchere himself, who has devoted the best years of his life to this high art industry, and who is known to not a few Americans, is prevented from coming to the Exposition; but Mr. Kok, the director of the Rosenberg pottery, will soon arrive here instead to give the installation of the exhibit his personal attention.

Written for The Clay-Worker.

THE CHICAGO SITUATION.

JUST WHAT building conditions will prevail through the season is now rather problematical. The general outlook is good. Demand for new structures for mercantile uses and purposes of speculation is brisk, lots of figuring is being done in the offices of architects, contractors and material dealers, and much construction is actually in progress. Besides this, neither the price of material nor labor is excessively high. Prices rule about as they have for the past two months. Two old buildings in the downtown district on Madison street are being razed to make room for skyscrapers, the plans for which have already been drawn. The new Railway Exchange Building, which will house the general offices of several railroads, is already completed and being filled with tenants, among them a number of leading Chicago architects.

While in general everything seems favorable to a prosperous building season in Chicago, however, there is a strike on among the lime and cement teamsters, which, if long continued, will tie up building, throw workmen in the building trades out of employment and cause a period of depression at a time when naturally everything should be booming. The trouble started when the lime and cement teamsters employed by two firms struck for an increase from $2.25 to $2.50 a day. Immediately all the firms in the stone, lime and cement business in the city, or practically all, got together and formed an association and proceeded to declare a lockout until the teamsters should come to time and the matter of wages be settled. Each side, however, seems to have been waiting for the initiative to come from the other party in the matter of reaching an understanding, and meantime the trade has suffered. Work on big buildings in the downtown district has been delayed or stopped, because it has been practically impossible to get material. Few of the buildings had enough lime and cement on hand when the strike was called to last for more than twenty-four hours. Brick and stone work was stopped or delayed for lack of lime; iron work came to a halt in many instances because there was no material to be had for the concrete foundations. Prepared lime valued at thousands of dollars was spoiled in the yards the next day after the strike was called because it could not be delivered. Street work and paving are almost at a standstill, and for the first few days several firms were obliged to pay demurrage on between fifty and one hundred cars of rubble stone because they were unable to furnish teams to unload it.

While the outlook in the city is fairly bright, though somewhat shaded by the lime and cement lockout and the possibility (which threatened to become a fact last week) that the trouble may spread to other branches of the building trades, the outlook about Chicago is better, according to manufacturers, than it has been for a good while.

D. V. Purington, of the Purington Paving Brick Company, reports the paving brick trade brisk and the outlook promising. The Southern Fire Brick and Clay Company also find the outlook good and are planning to enlarge their plant at Hillsdale, Ind., which has at present a capacity of about 50,000 a day. Its capacity will be increased a third to a half.

The decision to enlarge the capacity of the Hillsdale plant indicates in material circles here not only belief that the business of clay producing is still in its infancy and that the coming seasons will bring increased demands, but also the conviction apparently that the Southern Fire Brick and Clay Company will come out first best in the chancery proceeding between them and the Garden City Sand Company, now pending in the Superior Court of Cook County. The proceeding, which has been in progress for some time, has attracted considerable attention among the trade, particularly some of the counts made in the answer of the Southern Fire Brick and Clay Company.

About a year ago the Garden City Sand Company and others filed in the Superior Court a bill praying that the Southern Fire Brick and Clay Company be restrained by order of the court from disposing of the product of their new plant to any one but the Garden City Sand Company. The bill was filed shortly after the plant was ready for operation, and Dick Lanyon, from whom the Southern people had purchased the site of the Hillsdale plant; James Heber and Willis S. Bonebrake were made parties defendant in the action. As the basis of their plea the plaintiffs alleged the existence of a contract dating from September, 1901, between the plaintiffs on the one hand and Dick Lanyon, Heber and Bonebrake on the other. By the terms of this alleged contract, according to the complainants, Lanyon, Heber and Bonebrake agreed that from their property, described at length in the bill, they would mine, grind, screen and load f. o. b. cars at Jonesdale switch first-class marketable fire-clay at the rate of 77½ cents per ton, at such times as the complainants might order. The complainants further allege that by the terms of the alleged agreement Lanyon and the rest were to erect and equip upon the property described a fire clay plant, and were also to agree not to work, lease or operate any other fire-clay grinding plant for the purpose of selling fire clay on any land then owned and controlled by Lanyon, Heber and Bonebrake. The complainants also aver that they agreed in this alleged contract to take 40 tons of fire clay daily from Lanyon, Heber and Bonebrake at the rate mentioned above and to buy no fire clay in Indiana during the life of the alleged contract—eight years—except from the parties defendant named in the bill. The Garden City people also assert in their bill that the plant which Lanyon was said to have been bound to build was practically finished at the time that the Southern Fire Brick and Clay Company bought from him a portion of the land described in the bill as having been covered by the terms of the alleged contract, and that prior to the consummation of the negotiations for the purchase of the site the complainants warned the Southern Fire Brick and Clay Company of the alleged existence of the said contract.

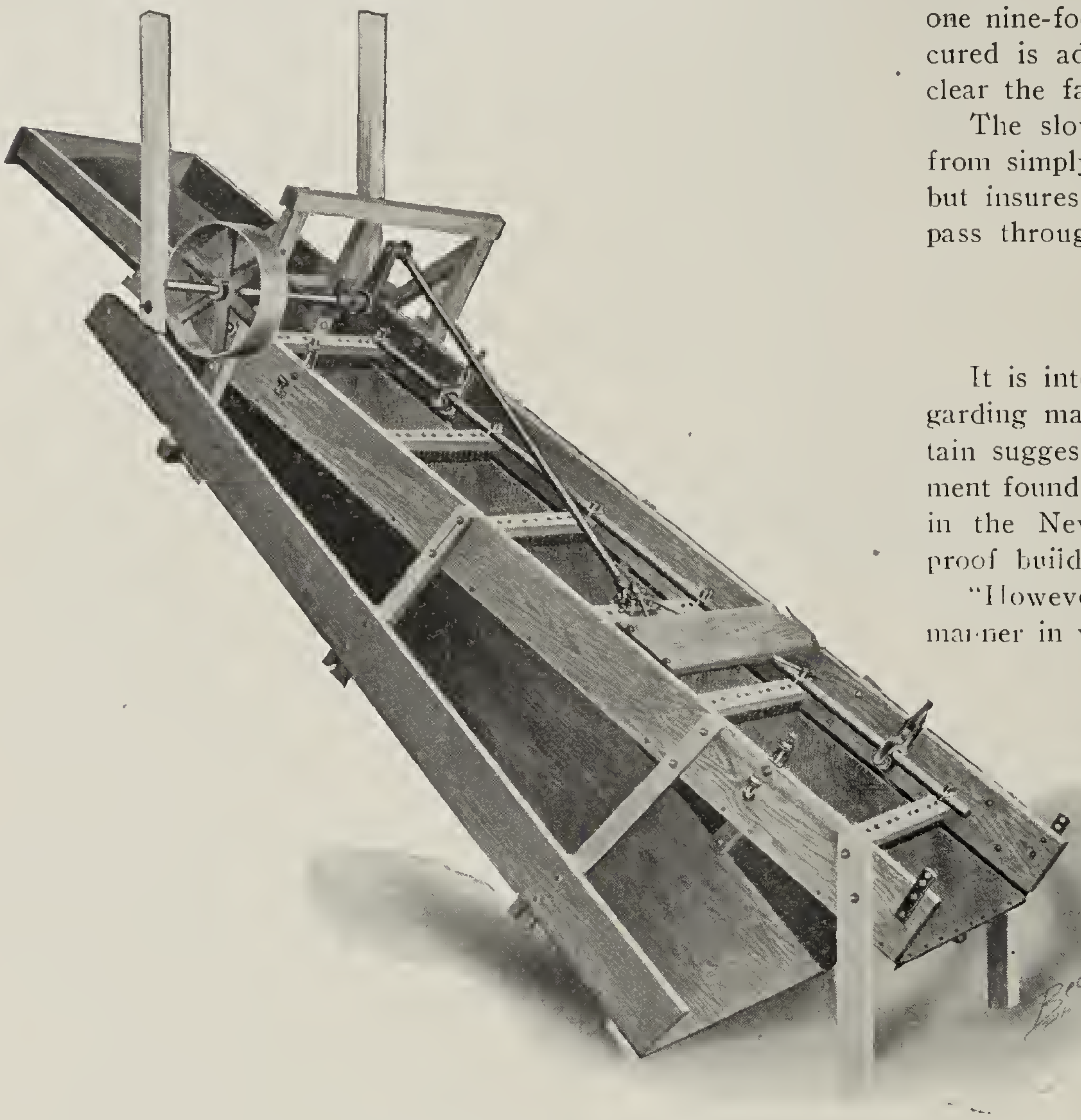
The answer filed by the Southern Fire Brick and Clay Company is no less detailed than the bill. They deny that they ever heard of the existence of the alleged contract except by hearsay, and aver that if the contract did exist at the time of their purchase it was not being actually enforced, and intimate that Dick Lanyon et al. made the sale in order to equip the plant on the part of his land not conveyed to the Southern Fire Brick and Clay Company. They also deny negotiating for the plaintiffs' alleged interest in the land described. The answer of the defendants then calls the attention of the court to the delay in filing the bill for injunction. They complain that while the purchase was consummated in September, 1902, and plans publicly made for the immediate erection of a large fire clay plant, the bill was not filed until the defendants had expended $200,000 on building and equipping their plant and had it almost ready for use. The defendants then charge that the object of the complainants in seeking to have the defendants restrained is "to remove, if possible, a competitor from the market," and urge the court not to grant the injunction on the ground that it would give the complainants an undue commercial advantage. The answer closes with the argument that even if the existence of the alleged contract were proved and all the allegations of the plaintiffs showed to be true, the bill should still be dismissed on the ground that the alleged contract is "void, as being in restraint of trade."

The "battle ground" is rich in fire clay of good quality and the outcome of the legal strife is awaited with some interest. The court at the first hearing refused to grant a temporary injunction and referred the cause to Master in Chancery Humphrey, who has been hearing testimony for several months. The taking of testimony is thought to be nearly completed and the case will probably soon come to a final hearing before the court.

Some indication of what the season will be if all goes well may be had from the character of the following contracts, which have already been let and work of some sort commenced:

D. H. Burnham & Co., architects for the new building of the Chicago Orchestral Association to be erected at 165 Michigan avenue, have awarded the general contract to the Thompson-Starrett Company. The building will cost $450,000, having a front of 105 feet in Michigan avenue and a depth of 171 feet. Wrecking the old building standing on the site has been begun and the new structure is to be completed by January 1. The Thompson-Starrett Company have also secured the contract for the foundations and masonry of the twenty-story building which Otto Young is about to put up at the southwest corner of Wabash avenue and Madison street. The building will cost in the neighborhood of $1,500,000. The razing of the old building on this site has been commenced.

The contract for a thirteen-story building at the southeast corner of Clark and Monroe streets has been awarded to the George A. Fuller Company. Charles E. Rector will put up this building in the place of the old building—now being torn down—in the basement of which Rector's restaurant, one of the best-known in Chicago, was located for years. The building will cover an area 90 feet square. The exterior finish will be in limestone, brick and terra cotta. The interior will be furnished throughout in mahogany. The basement and first floor will be occupied by the builder, Mr. Rector, for restaurant purposes, and the upper floors will be divided into offices. The cost is estimated at $700,000. The Fuller Company has also received the contract for the construction of the new building in which will be situated the offices of the Chicago & Northwestern Railway. This will be a fourteen-story building in Franklin street, extending from Quincy street to Jackson boulevard. It will cost about $1,200,000.



The H. G. Virgin Clay Screens.

Preliminary drawings for the proposed McCormick Memorial Hospital have been made by Architect S. S. Beman. The sketches call for a four-story building of pressed brick and stone construction, and the cost is estimated roughly at about $500,000.

SCRIB.

THE VIRGIN CLAY SCREEN.

IN THESE DAYS of sharp competition, the successful clay-worker must pay close attention to every detail of his business. One of the most important details in the manufacturing department is the preparation of the clay. The proper screening of the raw material is essential for the production of uniform ware. Mr. H. G. Virgin has perfected a device for this operation which is shown in the accompanying illustration. It is manufactured by the Chambers. Bros. Co. Philadelphia. The standard size screen is 16 feet in length, width of screening surface, 4 feet; pulley, 30 inches in diameter by 6½ face; speed, 30 revolutions per minute. As shown in the cut, it is furnished with clay distributors consisting of brushes which do not wear the plate. This size has been found ample for the product of one nine-foot dry pan. The frame to which the brushes are secured is adjustable as to height, so that the brushes may just clear the face of screen plates.

The slow reciprocating motion of brushes prevent the clay from simply running to the bottom as on most inclined screens, but insures the screening of all material that is fine enough to pass through the screen openings.

FIREPROOF STAIRWAYS.

It is interesting to note the views of our contemporaries regarding matters of a local nature, more especially if they contain suggestions of practical value. A case in point is the comment found in a recent issue of the *Brickbuilder* touching changes in the New York building laws regarding stairways in fireproof buildings, which is as follows:

"However much question there may be as to the equitable manner in which New York building inspectors are permitted to exercise their discretion, the building law of that city is in many respects the best in the country and it goes into scientific details to an extent that no other municipal ordinance has followed. The changes which from time to time have been made have been on the whole judicious ones, and in accordance with scientific knowledge, and if the laws are not rightly enforced or do not always produce the best results, the trouble is seldom with the wording of the statutes. One of the latest changes is in regard to stairways in fireproof buildings. Heretofore, a construction including iron stringers, cast iron risers and slate or marble treads was considered sufficient; but it was found by fatal experience that the combined action of sudden heat and water would so shatter either marble or slate that a platform or tread might be wholly inadequate to bear the weight of a single individual. The law, consequently now provides that where stone or slate is used, such material shall rest upon a solid tread of wrought or cast iron. Unfortunately compositions of concrete, which in our judgment are quite as liable to disintegrate as either marble or slate, are still allowed to pass the law. Undoubtedly the most perfect construction which could be devised for this purpose would be hollow terra cotta blocks, which have been made to form the riser, tread and soffit of each step in a single piece, and which can be built up in place in same manner as some of the older constructions in stone so as to be self-supporting and not requiring the use of steel."

For desirable situations read THE CLAY-WORKER want ads.

Written for The Clay-Worker.

KILN ATMOSPHERE.

Burning Sandy and Dense Clays.

IN BURNING BRICK or sewer pipe, that burns to a somewhat porous body, we can save a good deal of time and labor by creating a reducing atmosphere in the kiln. In other words, we must fire heavy, admit no air over the fires and shut off part of the draft at the stack with the damper; this creates a reducing atmosphere.

With sewer pipe we may carry on this reducing reaction. for. several hours before salting, and although the body of the pipe may not show a blue or black color all the way through, we will observe a blue-black ring around the edges, the body in the middle being red. By salting on such a flashed surface of the pipes they will be of a dark or blue color, but by keeping on too long with the reducing flame we will cook the iron out to the surface of the pipe, to which contractors and sewer inspectors object seriously. This condition can be avoided by spending all your skill not to create any black smoke during salting. Fire so you will have reduction in the kiln and the same time oxidizing atmosphere when salting. In other words, you can shut part of your draft off, having reducing draft, and then by open-light fires, put on frequently, you can have an oxidizing atmosphere to prevent the iron from cooking out.

To create an oxidizing atmosphere in a kiln you must not necessarily fire open and with full draft; it depends a heap on the full draft capacity of your stack how you should fire. When you burn a sewer-pipe kiln the first time, the bottom, the underground flues and stack have all full draft capacity, and if the opening flue into the stack measures 36 inches, you may shut off the stack opening 24 inches and still have plenty of draft, in fact enough to have oxidizing atmosphere in the kiln during the whole burn. But later on, when the perforated bottom and flues gradually fill up with sand (used in setting the pipes or paving brick) and broken rings (chuck) where the pipes are set on, then you will also gradually need more draft and finally all the draft of your stack. You do not need to use a damper to cut part of the draft off, but the time will come when you need more draft, and you cannot create an oxidizing atmosphere any more, simply because you have not enough draft. The kiln atmosphere will be reducing in spite of careful open fires, and then it is time to clean the kiln bottom and flues, and the original conditions will prevail again; you will have too much draft for some time, and of course you can regulate this with the damper; but I say this, that when the bottom becomes filled up and choked you cannot pull the heat down through it and on through the stack if you had a stack as high as a mile long and an acre square in the clear.

Try to set a kiln of brick or pipe with a good open bottom and a stack 30 ft. high. This kiln will draw and the other one will not. In one you can create an oxidizing or reducing atmosphere at will, but in the other you cannot create any atmosphere at all except created by natural surroundings, but not by artificial heating..

Now, in regard to a sandy clay, we know that it will burn easier in less time in a reducing atmosphere and the body burns in red-burning sandy clay blue or black, while in a buff-burning clay the body burns grayish, but after cooling off in the kiln it changes to the original color on the bottom courses and sometimes from bottom to top. Why? Because the reducing reaction was not intense enough and of not long enough duration. The result is soft pipe on the bottom. We come hereby to the conclusion that a sandy clay manufactured into pipe, or anything else to be salt-glazed, should be fired in reducing gases from the time the heat is visible through the stack-flue, or five to six hours before salting. Then about two hours before the kiln is ready for salt clean the fires, fire light and open, pull the salt through with a full draft, and a bright, smooth glaze will be the result. If the clay should be so sandy that it does not vitrify, it will stand reducing atmosphere even in salting, because if the body becomes black it will change again in cooling.

Now, in regard to dense-burning clay or shale, an oxidizing atmosphere is of great importance in all the stages of the burns and especially in the heating up. If the fires are rushed at that stage, the ware will swell and become a spongy, worthless mass. Sewer pipe sometimes show this defect, and paving brick and blocks must be carefully heated up in this respect to avoid bloating. To find out whether a clay gives best results in an oxidizing or reducing atmosphere has cost many thousands of dollars, and my advice is to put up a small kiln for testing brick before trying to burn a large kiln, not knowing how to proceed with the burning. Some clays give good results in down-draft kilns in oxidizing, and some give better results in reducing gases. Therefore it is best to find out which atmospheric conditions are best suited for a clay before spending too much money in building kilns. A small test kiln is a very good investment and more reliable than having unburned brick sheded away to be burned under all kinds of atmospheric kiln conditions—maybe burned in a down-draft kiln, set among fine pressed brick in a sagger (orptected from flashing or fire marks) to show up fine, and then when burned open in an up-draft, cased-up kiln of 500,000 capacity, the most of the brick are not anything like the sample, not even good enough for any kind of a market, where even the demand is in excess of the supply, still such brick are turned out at times, though not salable at any price.

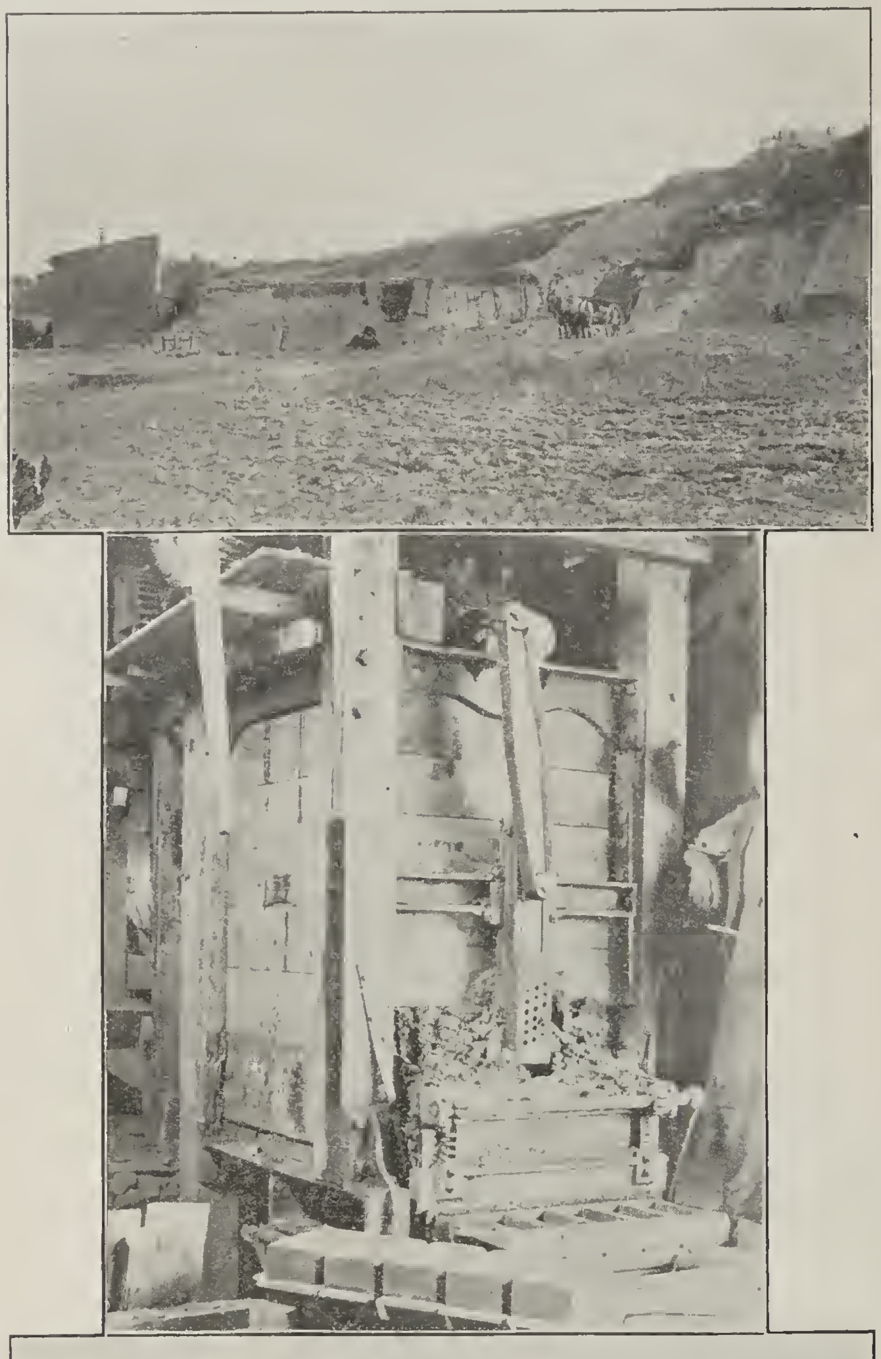
Any one investing money in the clay business cannot be too careful how he lets his money go; when it's gone through failure of successfully burning the first kiln it will never come back, and another brickyard will be for rent or sale. Test your clay; make it in full-size bricks through different processes—not small samples; they are not reliable. You cannot tell a thing about a clay until it has passed through the heat as a full-sized piece of ware that you intend to make, be it brick or sewer pipe or anything else. What the other fellow tells you of unburned clay is nothing but an uncertain claim, as uncertain as death is certain. It may turn your hair grey and shatter your hopes and exhaust your bank account, and the coming millions that you expected are a snare and a delusion.

A. V.

FIREPROOFING.

False Economy in Fireproofing.

IN A BUILDING erected some years since, which cost complete $365,000, the contract price for the terra cotta floor blocks was $17,000, or 4.65 per cent. of the total cost of the building. In another building erected only a short time since, quite elaborate in its design and constructed with an exterior entirely of granite and hence quite expensive in price per foot, the total cost was $1,000,000, while the entire fireproofing was contracted for at $38,000, or 3.8 per cent. of the cost of the whole. It is probably safe to say that the whole expense of fireproofing need never exceed 5 per cent. of the cost of any building, this price, of course, covering merely floors and other protective work, but not the beams or columns themselves. The difference between the very cheapest forms of so-called fireproof construction and the very best which scientific ingenuity has thus far evolved would be represented by a sum considerably less than one-half of 1 per cent. of the total cost of the ordinary building. And yet the security of the entire structure is often very correctly measured by the quality of the fireproofing. Under such circumstances it seems the height of folly to consider anything but the best when fire protection is desired. Rather than to cut on so relatively inexpensive a factor of the whole cost of the building, our architects and constructors ought to feel justified in considering that in this part of the work the question of expense does not cut any figure, and that the most careful study of each problem ought to be made to solve it in just the right way, rather than to adopt the least expensive method, because at the very most the best way does not involve such a large amount of money, and the best is none too good to serve its purpose. During the past year the country has had a great deal of very stirring practical experience in connection with fireproofing construction and methods, and with each recurring fire or conflagration the testimony of architects, engineers and all who have given such questions serious study has been to emphasize the necessity for more care, better methods and more complete protection. If, therefore, we are to rightly profit by all these examples it is beyond question the duty of the architect and the engineer to advise his client to pay for what gives the most for his money, and under no circumstances to curtail this most essential feature of the building.



Views 1, 2 and 3. The Bitterne Park (England) Brick Works.

There is another direction in which a great deal of false economy is practiced. In the days of not so very long ago, before architectural engineering was an exact science, many of our best builders seemed to possess a sense by virtue of which they could tell by merely looking at it whether a beam of a column was sufficiently strong. They often made mistakes, but on the whole it is doubtful if their mistakes were any more far-reaching than such as have occurred more recently as a result of too close shaving in the calculation of an engineer. Beam and column calculation has been brought to a nicety. The factor of safety is no longer a real factor of ignorance, as was so often the case in the past, but we must not save in our steel beyond reasonable limits, and it is a question whether our engineers do not figure too closely and not make sufficient provision for shocks, for unexpected loads or even for indifferent workmanship. There are some cases where the trained judgment of a practical builder is worth more than a set of Carnegie tables, and the Hotel Darlington accident has shown how quickly a steel frame building may collapse.—*The Brick Builder.*

Written for The Clay-Worker.

A NOTED ENGLISH BRICK WORKS.

BY GEORGE CECIL, LONDON.

PRAISEWORTHY ENERGY.

SOME BRITISH brickmaking concerns are foolish enough to be satisfied with the amount they earn every year; others apply that excellent trade maxim, "A business cannot stand still," with the result that their stock grows in value as the dividends increase. A firm of the latter description is that of Hooper & Co., who own the Bitterne Park Brick Works, in the south of England. Indeed, this concern foresaw that the demand for bricks in the neighborhood was likely to increase and lately made additions to its plant, with the result that it is now about as busy filling orders as it can well be. It should be borne in mind that a few years ago these works were doing but little business, and that now the concern is, thanks to the energy and foresight of its manager, occupying a leading position in the trade. The company's works are divided into three sections, and are, unlike those of some of its competitors, run on modern and progressive lines. It is also interesting to note that the works and clay-beds lie on rising ground and on the side of a hill, and that the property includes clay deposits, with fine sand below.

THE WEATHERED CLAY-HEAP WELL SITUATED.

In Illustration 1 will be seen the clay and sand pits. The bricks are dried on the usual style of hacks and are burned in a Warren kiln (see illustrations 3 and 5). It is interesting to note that beneath these upper ranges of hacks a bed of clay is to be found extending over the lower part of the works. It consists of two layers; the lower, which is some four feet thick, is somewhat sandy, but the upper one, which is about two feet thick, is strong and tough. The proprietors of these works are fortunate in having the weathered clay-heap for sand-faced bricks situated on the top of the sand about seven feet above the hack-ground level, for it can be wheeled into crushing rolls on the level without the assistance of a hoist. The crushing rolls feed into a Canadian five-mold brick machine, which is capable of turning out twelve thousand bricks a day. This machine forms a central feature in the group picture to the left.

GROUND LEVEL DELIVERY.

Conforming to the continental system, the plant is so designed that the clay is delivered to the machinery at ground level by tip wagons instead of being hoisted to the top of a building. It should also be borne in mind that it was found necessary to place the machinery low down on the hillside, below the clay. The plant includes an open mixer, nine feet long, which is placed below floor level, that the clay may be tipped into it without hoisting. At the center portion of the mixer the ashes for clamp burning are introduced into the clay; these are elevated by means of a bucket elevator, and subsequently passed through two crushing rolls, which are placed above the mixer. The mixed material is elevated by means of a rubber belt conveyor (eighteen inches wide) to the brick machine, which is furnished with one pair of rollers. The above portion of the plant is driven by a counter-shaft, the motive power being a 30 H. P. portable engine (Illustration 4). This counter-shaft is partly of five inches and partly of four inches diameter, and is provided with a friction driving-clutch, which in turn connected with a double-armed driving pulley. The whole machinery can be put in and out of gear by means of this clutch; moreover, it permits of wide belts being used. And, as every clayman knows, these belts run far more easily, slip less and wear longer, all things considered, than do the narrow ones.

750,000 BRICKS WITH ONE SET OF LININGS.

In addition to the above equipment, the works are furnished with a halsband metal line die and a water-lubricated zinc-top cutting table by the same makers. This die, it may be pointed out, is capable of making 750,000 bricks with one set of linings. The cutting table can also give a large output; provided with a traveling zinc top, it cuts three bricks at once, waste ends and ragged edges being unknown.

THE MANAGER.

Occasion may be taken to say that the manager of this flourishing concern is Mr. R. B. Pinchard, and that under his skillful management the firm's wire-cuts are made in quantities varying from 18,000 to 25,000 a day. These are dried on hacks and burned in clamps, and are in good demand.

INDUSTRIAL OPPORTUNITIES ALONG THE LINE OF THE LEHIGH VALLEY RAILROAD.

SECOND ONLY to the anthracite coal deposits, which have made the country traversed by the Lehigh Valley Railroad famous, are the many extensive and varied beds of plastic earths situated along the line of that road.

Particularly famed in this respect is the territory in and about Perth Amboy, N. J., where are to be found some of the largest clayworking establishments in the country, among which are the Perth Amboy Terra Cotta Company, the Standard Terra Cotta Company, New Jersey Terra Cotta Company, manufacturers of architectural and ornamental terra cotta; Ostrander Fire Brick Company, M. D. Valentine & Bro. Co., M. A. Edgar, Raritan River Clay Company, manufacturers of brick and fancy building brick; Adam Weber Sons Company, clay retorts, fire brick and fireproofing material; National Fireproofing Company (three factories), fireproofing material, fire brick, front brick, vitrified conduits for underground electric wires and sewer pipe; Henry Maurer & Son, all kinds of fireproofing material, fire brick, roofing tiles, front brick.

From here aluminous earth is shipped to all parts of the United States, and the deposits vary from the coarser kinds, used in the making of common red brick, to the finer kaolins, from which porcelain is manufactured.

Perth Amboy is also the largest producer of fireproofing material, which more and more is entering into the construction work of large buildings.

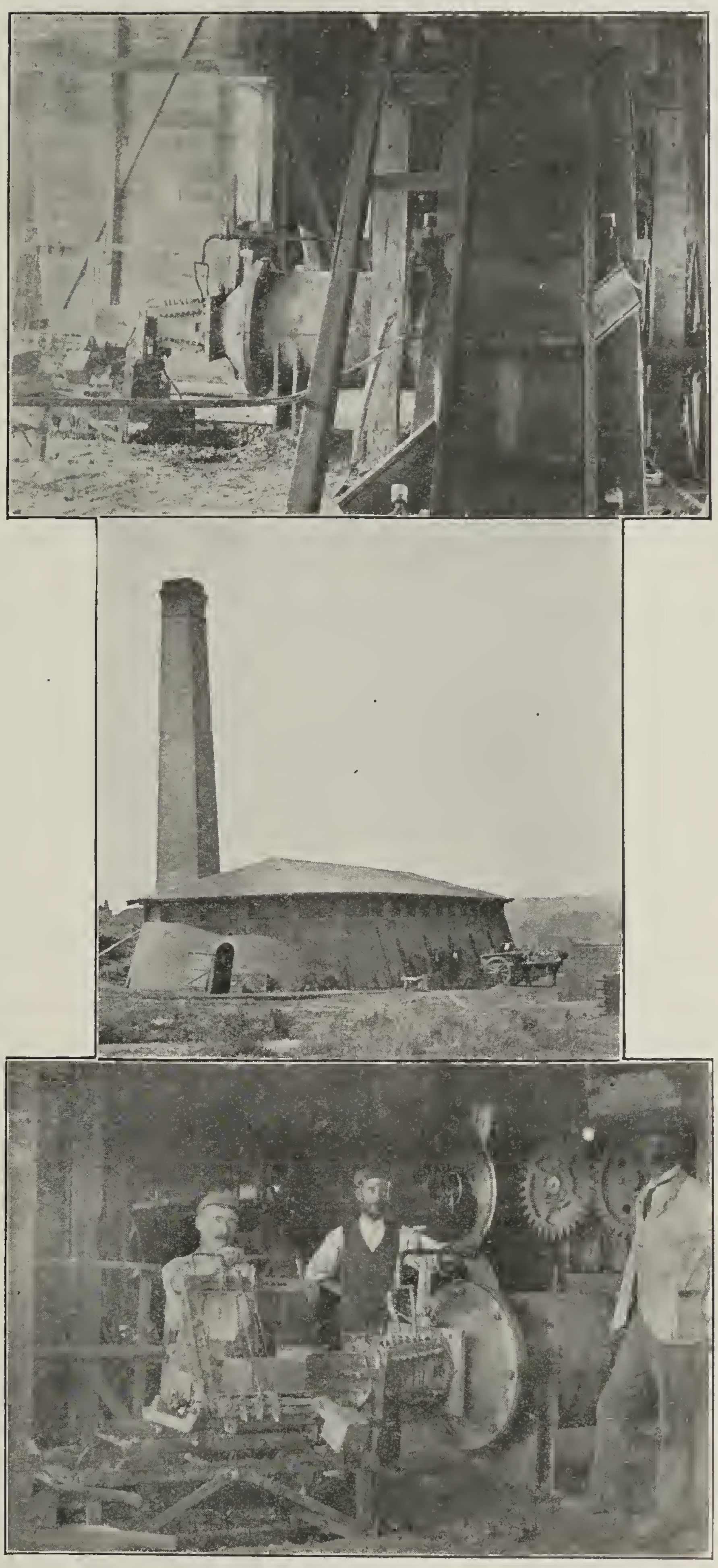
There are also important clay deposits at many other points on the line of the Lehigh Valley Railroad, notably at Easton, Allentown, Towanda, Athens and Sayre, in Pennsylvania, and Spencer, Breesport, Horseheads, Newfield, East Ithaca, Camden, Geneva, Odessa, Auburn, South Bay and Vienna, in New York.

The clay at Odessa, besides being utilized for brickmaking, has been found to be suitable for pottery also, that found at Newfields for paving brick and conduits, and Vienna has a very superior clay, entirely free from grit, which has for a number of years been sold on the market as fuller's earth.

The deposit here extends over an area of a mile by three hundred feet, and is of unknown depth. Borings which have been made show that it is at least twenty feet deep, with a probability of being several times that thickness.

At Caledonia and Gorham, N. Y., are marl beds suitable for the manufacture of cement, and the supply is practically inexhaustible, the largest being nearly nine miles in length, and the Caledonia Marl and Lime Company has a very fine grade in powder form which manufacturers of putty, rubber, linoleum and oilcloth are using in the place of whiting. At Canastota also are large marl beds which have never been opened.

The use of clay products is destined to very largely supersede stone in most of the departments of structural work, and the clayworking industry to increase in importance and magnitude, and as the Lehigh Valley Railroad is about to extend its line into a territory containing some of the best clay deposits extant, it is able to offer manufacturers wishing to engage in this industry very superior advantages.—*P. H. Burnett, Industrial Agent, in Black Diamond Express.*



Views 4, 5 and 6. The Bitterne Park (England) Brick Works.

UNITED FIRE BRICK WORKS (FORMERLY C. KULMIZ), OF SAARAU, GERMANY.

Something of the History and Practice of One of the Largest German Refractory Concerns.

TO FORM a general impression of the size and capacity of the works at Saarau, with which this article has to do, it is only necessary to look at the picture of the works and especially of the office building and to consider three figures: first, that the technical department employs ten draughtsmen; second, that there are twenty-two bench workers in the pattern or "form" shop; and finally that the number of workmen in the machine and blacksmith shops is about forty-five. These are side lights only, mere suggestions. For a more extended account of the operations of this concern, we are indebted to Mr. Schneider, their technical manager.

The fire clay works of the C. Kulmiz Co. of Saarau, in Silesia, is one of the oldest establishments of its kind in Europe. The late Carl von Kulmiz, who was engaged in the construction of railroads in the vicinity of Saarau, was the first to find, in the forties of the last century, the blue, tough lignite clay, and shortly afterwards the white quartzy kaolin. In 1851 the firm of C. Kulmiz, at Ida—and Marienhutte, near Saarau, commenced to manufacture refractory ware and was the first to introduce, in 1860, the lower Silesian refractory shale, which, on account of its high alumina content, is of especially great value. The latter has been mined in the lower Silesian coal measures for a long time being designated as Saarau clay, No. 1. The blue, very plastic and tenacious fire clay was called Saarau clay No. 2, and the white, lean quartz kaolin was called Saarau clay No. 3.

The sale of the Saarau clays to distant metallurgical and ceramic establishments was begun by the firm of C. Kulmiz in the fifties. In Saarau itself, fire clay is mined only by the Kulmiz Company. The annual production of the various Kulmiz clay mines in and near Saarau amounted to the following quantities of white and blue refractory clay:

In 1887, 35,900 tons (2,200 pounds per ton).
In 1888, 42,200 tons.
In 1889, 47,600 tons.
In 1890, 49,300 tons.
In 1891, 57,500 tons.

Near the old fire clay works at Ida and Marienhutte near Saarau, a new works was built on a more efficient basis by the C. Kulmiz Co. in 1872 and enlarged considerably in the beginning of the 80's. In 1884 the capacity of this new establishment was 28,000 tons of burnt clay wares.

The Saarau establishment consists of two independent departments, with independent power plants, molding and kilns, yet so arranged that they can assist each other at any time. The kaolin washing plant is close by, power being furnished for it by rope transmission. From the closest clay pits the clay is taken by means of dump cars to the factory and dumped into rolls or the washing cylinders.

The kilns are in part a special continuous system of six round down-draft kilns, in part continuous gas fired kilns with fourteen chambers, each holding 60,000 pounds of fire brick. These latter have been in constant operation since January, 1882. Again, semi-periodic kilns, similar to the Dahlhausen type, give off their waste heat, in large part, to the drying room arranged beside and above the kilns. The railroad tracks, which pass through the factory, permit of loading the ware from the kilns to the cars most conveniently.

The Halbstadt factory of the Kulmiz Company was built in 1889 in order to satisfy the demands of the markets of Austro-Hungary and Bohemia. This place is in Bohemia, on the line between Germany and Austria.

In this works, also, the track brings the clays and shales, the Dinas and quartzite raw materials, close to the crushing and grinding machines. In addition to the Saarau clays, this plant uses the best Bohemian raw materials. For certain purposes, clays possessing certain specific qualities are shipped in from western Germany.

The Halbstadt branch was built after the pattern of the Saarau works, the latter having proven to be a very satisfactory arrangement. The molding and drying are done in the upper stories of the buildings. But the retorts, which are made as long as twelve feet, are usually molded on the ground floor. The burning in Halbstadt is also continuous, the waste heat being used for pre-heating.

In 1889 a third works was built at Markst-Redwitz, Bavaria, This factory has about the same capacity as the works at Halbstadt and is equipped throughout with modern machinery and appliances. Toward the end of the year 1899, the works were changed to a new management, the United Chamotte Works (formerly C. Kulmiz), and the work is in connection with the well-known Stettin Chamotte Works Co., Limited, of Stettin.

The present owners of the establishment of C. Kulmiz are the three sons of the late founder. Their fire clay works and clay pits employ at present between seven and eight hundred persons.

The Kulmiz factories furnish fire clay and refractory products of all kinds, fire brick, quartzite brick, Dinas brick, gas retorts, muffles, tiles and molded brick of every kind. They undertake the designing of the best shapes and a complete construction of industrial furnaces and kilns. They furnish the complete refractory outfit for the building of blast furnaces with stoves of the latest construction, coke ovens, puddling cupola and steel furnaces, kilns for the burning of lime, cement and strontianite, shaft roasting and calcining kilns of all sorts, retort furnaces, glass furnaces and acid proof bricks and special shapes for celluloid and other chemical works. Carbon bricks, which of late are being required for blast furnace and a few other metallurgical purposes, as well as bauxite and magnesite brick are made both at Saarau and Halbstadt.

Since 1882 the establishment also builds industrial furnace plants like generator retort furnaces and lime kilns for sugar works, having a well trained staff for doing this kind of work. Round stacks are also built without the use of scaffolding of any kind. The brick used for this purpose are well-burned red radials. During the last ten years this company has built nearly 200 round stacks in Germany, Austria and Russia.

The value of the fire clay and Dinas products lies in their durability or resisting power. The aim in manufacturing these wares must be to consider the physical and chemical factors governing refractoriness under specific conditions. The correct designing of the shapes and their proper use in construction—proper laying up, also govern to a large extent the results obtained. It is always the aim to produce clean, exact shapes. Often this is an absolute essential, but not infrequently it is with great difficulty that it is accomplished owing to the slight plasticity of the material. Yet this aim is always kept in mind and the products are made as exact and neat as possible.

One cannot judge refractory ware by the looks. It can only be judged by the results of actual practice, which may often mean that the most expensive material is the cheapest in the end. The man using the products must always be the ultimate judge as to the quality.

The above account published by the refractories company, impresses one as being a pretty fair account of their practice, nothing being exaggerated, and nothing over-elaborate. In fact their whole system of advertising is worthy of attention. Their catalogues are well arranged and clearly illustrated, but they make use to a considerable extent, of pamphlet and single sheet reports and instructions. For example, here is a translation of one of these sheets, which is self explanatory:

Fire brick are to be laid with the corresponding refractory mortar.

Chamotte Mortar, (chamotte is used in the sense of burned clay-grog), is frequently called, by the public, chamotte meal. It is consequently the rule to order simple chamotte meal for the laying of fire clay brick.

Really, chamotte meal is not chamotte mortar, but only ground chamotte, that is, burnt and afterward ground clay; this material has absolutely no bonding power and is therefore not to be used *alone* for brick laying.

Many consumers wish to take the trouble to make the refractory mortar themselves. This is, for the most part, to be discouraged, for not every bricklayer, probably accustomed to other mortars, possesses the necessary experience to mix the chamotte meal with the refractorv bond clay necessary for it, in the correct and uniform proportion.

One who obtains real chamotte meal, that is, ground grog, should take about one-fourth part ground plastic refractory clay and mix the two intimately before adding any water.

It would not be at all allowable to use loam instead. For, if this loam is exposed to a high heat it begins to melt much sooner than the refractory materials, the bricks become displaced and the masonry suffers injury and fails to hold together.

For brick laying it is therefore better to obtain mortar ready mixed—12 to 15 per cent. of the weight of the brick, which requires no addition excepting that of water; with this the laying is to be done with as thin mortar joints as possible.

By such a communication as the above the refractories firm endeavors not only to introduce their mortar for the sake of selling the same, but also to protect the reputation of their brick. For it is entirelv possible that a piece of refractory masonry may give way and reflect discredit on the manufacturers of the brick when the latter are up to the standard, the real failure being in the mortar. In the same way they both advertise and protect their glass pots by "educating" consumers as to the manufacture of the pots and the care which they should have in practice. Note the following:

Glass Pots. Since the old process of making glass pots from raw and burnt clay, containing some refractory grog, does not tend to produce an article capable of meeting modern requirements, we have used for the ground body for glass pots, Bohemian shale clay, a pure shale clay which has been designated by Professor Bischoff as a most refractory material and which is attacked but slightly by fusing alkalies, gases, etc. This property might give rise to the danger that this shale clay, when it gets into the glass batch, will not melt, but will remain in the glass in the shape of a stone-like lump. Hence it must be the aim to bond the shale of the pot so thoroughly by means of plastic clay that it will not be removed mechanically, nor chemically dissolved from the body. In other words, by a suitable combination with the best, difficultly soluble bond clays, and by a suitable mechanical preparation and working, the body must become so dense that fusion cannot penetrate it. It is obvious that aside from a suitable composition of the bonding clays, this can only be obtained by a proper treatment of the clay previous to the forming process. For this purpose, the body is kneaded thoroughly by machines, five times, then kept moist in a cellar for six months and finally rendered free from pores and air bubbles by a so-called "beating" machine. This body, which has now lost all elasticity, is especially suitable for making a glass pot which will show a very uniform and dense body and will be attacked but slightly by the fusing mixture. The glass pot body, rolled up into a wad, one centimeter in diameter, when bent around the finger must show no cracks. It must also be free from cracks when made up into a pretzel. The glass pot itself is now made in a cellar by the so-called Bohemian method—using a mold—and is carefully trimmed and polished when in a leather-hard condition. It is very important that the pots be dried carefully and uniformly. Since the pot is thickest at the bottom, it is necessary to retard the drying as a whole, as much as possible; to keep the pots covered and to place beneath each one, either a fire clay tile or coarse grog, and to incline them as soon as possible in order that the bottom may be reached by the air. It is always best to do the drying in a cellar. After the pots have become white, they may be dried out without trouble in a rather warm room. If these pots are now annealed in the annealing furnace, using great care of course, taking three days to bring the heat up to visible redness and firing five days in all, no cracking will be observed.

It is always to be recommended that the mixture be placed in the middle of the pot so that one side of the wall shall not be cooled too much. Before our pots are used, they must be kept at the highest melting temperature for at least twelve hours so that they may take a "self" glaze on the inside. When this is done they become more durable and with constant use are good for fourteen weeks.

This firm also makes use of single sheet reports of the analyses, together with the pyrometric tests, of both their raw materials and finished products. These reports may serve either as an advertisement or as a guarantee, or both, and come invariably from the Chemical Laboratory for the Clay Industry—Prof. Dr. H. Seger and E. Cramer.

A few of these reports may be interesting in that they throw a little light on the relation between chemical composition and refractoriness.

Brick, quality "O."
Refractory value, cone 33 (approximately).
Analysis:

SiO_2	69.65 per cent.
Al_2O_3	28.71 per cent.
Fe_2O_3	1.20 per cent.
	99.56 per cent.

Brick of quality "A."
Refractory value somewhat above cone 33.
Analysis:

SiO_2	62.5 per cent.
Al_2O_3	35.3 per cent.
Fe_2O_3	1.6 per cent.
	99.4 per cent.

Brick of quality "M."
Refractory value slightly below cone 34.
Analysis:

Loss on heating	0.18 per cent.
SiO_2	69.48 per cent.
Al_2O_3	27.94 per cent.
Fe_2O_3	1.26 per cent.
CaO	trace.
MgO	0.32 per cent.
Alkalis by difference	0.82 per cent.
	100.00 per cent.

Brick of quality "XX."
Refractory value about cone 34.
Analysis:

SiO_2	52.5 per cent.
Al_2O_3	43.6 per cent.
Fe_2O_3	1.6 per cent.
	97.7 per cent.

Dinas (Silica) Brick.
Refractory value, between cones 34 and 35.
Analysis:

SiO_2	95.1 per cent.
Al_2O_3	2.0 per cent.
Fe_2O_3	0.7 per cent.
CaO	2.1 per cent.
	99.9 per cent.

Blue plastic clay.
Refractory value slightly below cone 35.
Ultimate analysis:

Loss on heating	12.6 per cent.
SiO_2	48.1 per cent.

Al_2O_3	35.5 per cent.
Fe_2O_3	2.5 per cent.
	98.7 per cent.

On a basis of burned material:

SiO_2	55.0 per cent.
Al_2O_3	40.6 per cent.

Rational analysis:

96.9 per cent. clay substance.
2.4 per cent. free silica (finest sand).
0.7 per cent. feldspathic particles.

This plastic clay is mined by the company on their own property, a few miles from the works, and shipped in by rail. The deposit lies near the surface so that there is but a thin layer of cover to strip and is worked as an open pit. Considering the fact that the deposit is about twenty-five meters thick, one naturally concludes that the "winning" is a simple and easy process. It is simple, but not easy, for wet plastic clay can neither be dug nor shot, but must be cut out in blocks. But more on this subject in another connection.

Their Schiefer-thon non-plastic coal measure clay mentioned in the translated account is bought and shipped in. None is obtained in the raw condition, the mining company calcining it all at the mines.

The ganister for silica brick is also purchased and must be shipped in from some distances. But the most interesting of the raw materials is the extensive bed of primary granitic kaolin. This deposit is somewhat similar to that at Radeburg in that it still retains, to a large extent, the form and color of the mother rock. It is notable, however, that the kaolin loses its color upon drying, all the dry material being white. From a superficial inspection, one would hardly judge it to be highly refractory, for the crystals of mica and feldspar and the quartz grains sparkle like diamonds in the sunlight and give one the impression that the clay is highly micaceous. It is siliceous, but aside from that, comparatively pure. A report from the laboratory already quoted, will give a more accurate idea of its properties.

Raw Kaolin of Saarau.

A Contribution to the Knowledge of German Kaolin.

The fire brick factory of C. Kulmiz, Ltd., of Saarau, in Silesia, sent from their clay pit from which, as is known, the clay is hauled on an inclined plane with two tracks, a trial sample of raw kaolin, kaolinized insitu from granite. The melting point showed that the refractoriness to be about cone 35.

The composition, according to rational analysis, is as follows:

Quartz	38.05 per cent.
Feldspar	0.61 per cent.
Clay substance	61.34 per cent.

The ultimate analysis gave the following composition:

SiO_2	67.09 per cent.
Al_2O_3	23.77 per cent.
Fe_2O_3	0.70 per cent.
Ignition loss	8.50 per cent.
	100.6 per cent.

Assuming that the iron is mechanically mixed and came from the weathering of pyrites, which is often found in granular form in granite, the clay substance has the following composition:

Al_2O_3	38.97 per cent.
SiO_2	47.07 per cent.
H_2O	13.69 per cent.

Clay substance is theoretically:

Al_2O_3	39.8 per cent.
SiO_2	46.3 per cent.
H_2O	13.9 per cent.

For comparison, let an earlier analysis of the Kulmiz kaolin be quoted:

Dr. C. Richters found, as is stated in his pamphlet, "Investigations Regarding the Causes of the Fusibility of Clays" (Breslau 1868), the following composition:

(See also Ding. Polyt. Journal, 1868, Vol. 191, page 230.)

SiO_2 (chemically combined)	19.99 per cent.
Quartz	55.89 per cent.
Al_2O_3	17.31 per cent.
Fe_2O_3	0.56 per cent.
K_2O	0.46 per cent.
H_2O	5.70 per cent.

and in a sample removed by washing in the laboratory:

SiO_2	45.39 per cent.
Al_2O_3	39.34 per cent.
Fe_2O_3	1.28 per cent.
K_2O	1.04 per cent.
H_2O	12.95 per cent.

One sees from this that the operations now carried on at a greater depth, amounting in 1880 to 17,800 tons but now taking out an average of about 35,000 tons yearly, furnish a kaolin not less valuable but much richer in clay substance.

In the Kulmiz practice the greater portion of the incorporated quartz is separated by washing on a large scale, as is shown by an analysis by Dr. Julius Aron. He found in the washed kaolin taken from the Kulmiz washing outfit:

Loss on Ignition	12.57 per cent.
SiO_2 (combined)	40.89 per cent.
Quartz	7.38 per cent.
Al_2O_3	36.30 per cent.
Fe_2O_3	1.16 per cent.
	98.30 per cent.

Or calculated as burnt kaolin:

SiO_2	55.0 per cent.
Al_2O_3	41.4 per cent.

It would contribute materially to the knowledge of the raw materials of Germany if still other manufacturers would come before the public with older and newer investigations.

CHEMICAL LABORATORY FOR CLAY INDUSTRY,
PROF. DR. H. SEGER AND C. CRAMER.

Berlin, October, 1896.

The washing referred to in the above is a suspension process carried on in large vats. Only a small portion of the kaolin used is treated in this way, the unwashed material being refractory enough for most purposes The process is somewhat expensive, owing to the necessity of putting the decanted liquid through filter presses.

The factory equipment has already been described, but there are some rather unusual features in the practice.

The raw clay is nearly all dried on the tops of or around the kilns—an economy of heat. The grinding is not unusual—crushers and dry pans. Ball mills are used to a limited extent. The mixing of the various batches is done with extreme care, the different portions being dumped on the floor together, carefully mixed dry by hand with shovels and then shoveled into a chute which runs the mixture into a covered, double, horizontal mixer of the pug mill pattern, where it is tempered.

Most of the making is hand work, of course, but some machines are used. One was noticed which is very similar to the hand screw presses used in building brick works for making special shapes in a dry way. Here it is used as a stiff mud press, the tempered clay being thrown into the iron molds and then receiving one good squeeze from the press which is worked by two men.

The drying of the ware is considered one of the most important features, being carried on very slowly. Some of the larger pieces are allowed to stand six weeks before going to the the kiln. This requires large drying space, but this is one of the things to which one becomes accustomed in Germany. And it must be admitted that they do not have the same proportion of loss by cracking as is common in American practice, where "Haste makes waste" and (in some cases) carelessness cuts profits.

Written for The Clay-Worker.

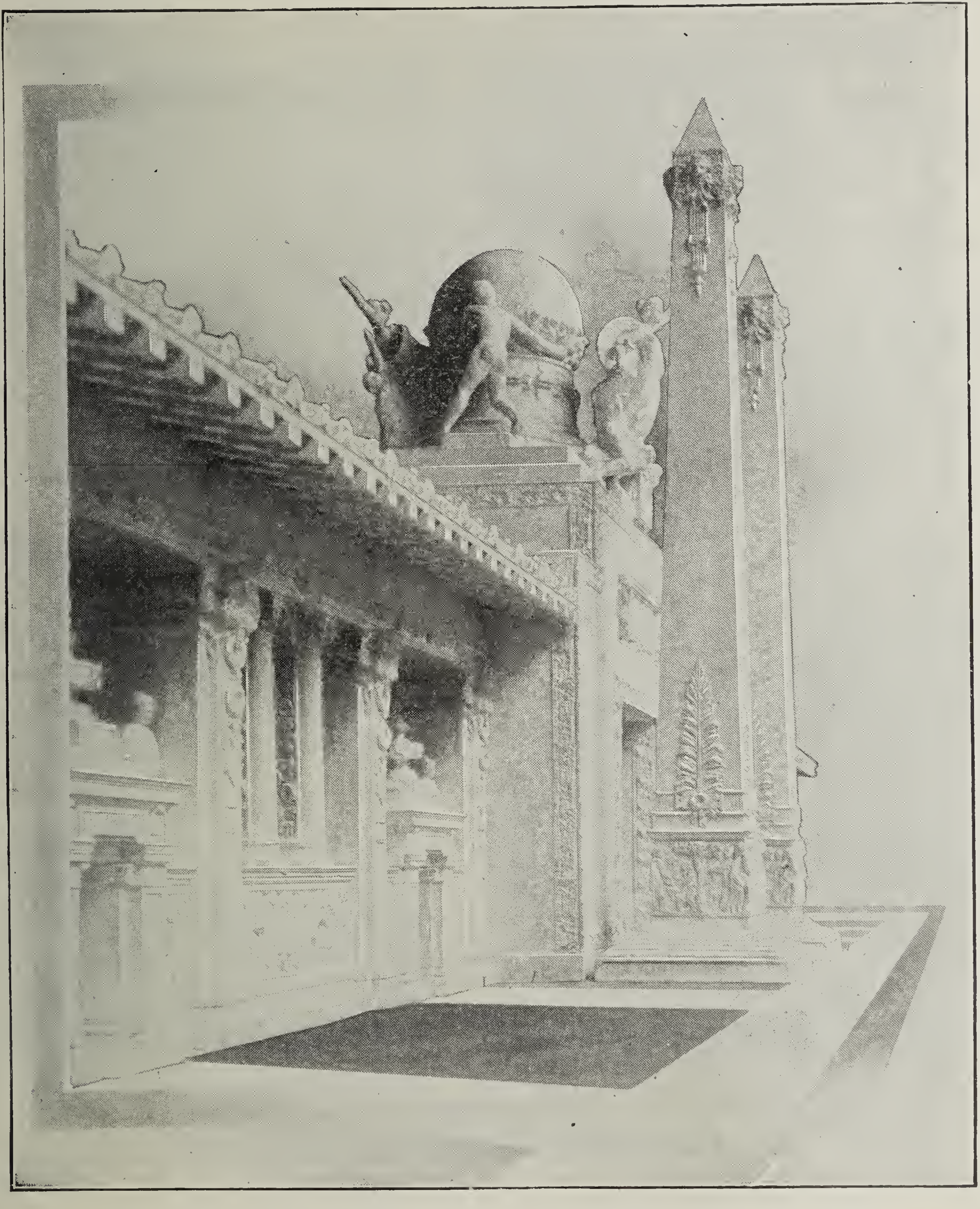
THE WORLD'S FAIR CITY.

St. Louis Dons Holiday Attire and Opens Wide Her Gates to the People of All the World—Features of Special Interest to Clayworkers.

A DAY AND SEASON that was in full harmony with the high hopes and aspirations of the nation was April the 30th, 1904, when the international exposition commemorating the purchase of the Louisiana Territory was thrown open to all the world. There are epochs of far-reaching importance in the histories of all peoples that make their impress for good or ill along the roll of time, and this Louisiana Purchase Exposition is surely one.

No one thing was wanting to fill the breast of every American with just pride. No need for vainglorious boasting was there. All we had to do was to look around. The immensity of the undertaking proved the energy, the enterprise and the wealth of our people. The marvelous beauty of the complete picture proved their high artistic feeling. Even the weather was an exhibit of our splendid climate and showed to the many visitors from other lands that for sunny skies we have no need to roam.

We have written so much and recently about New St. Louis, her industries, her miles of excellent brick-paved streets and her beautiful brick-built dwellings that there is no need to repeat the story here; but a few days ago we made a picture on the famous Pike—the mile-long avenue of recreation—which shows the very latest brick pavement in St. Louis. It is true that this brick pavement would not be accepted by any municipal engineer, for its condition is by no means perfect, as a brick pavement should be, but when we take into consideration that it has no foundation



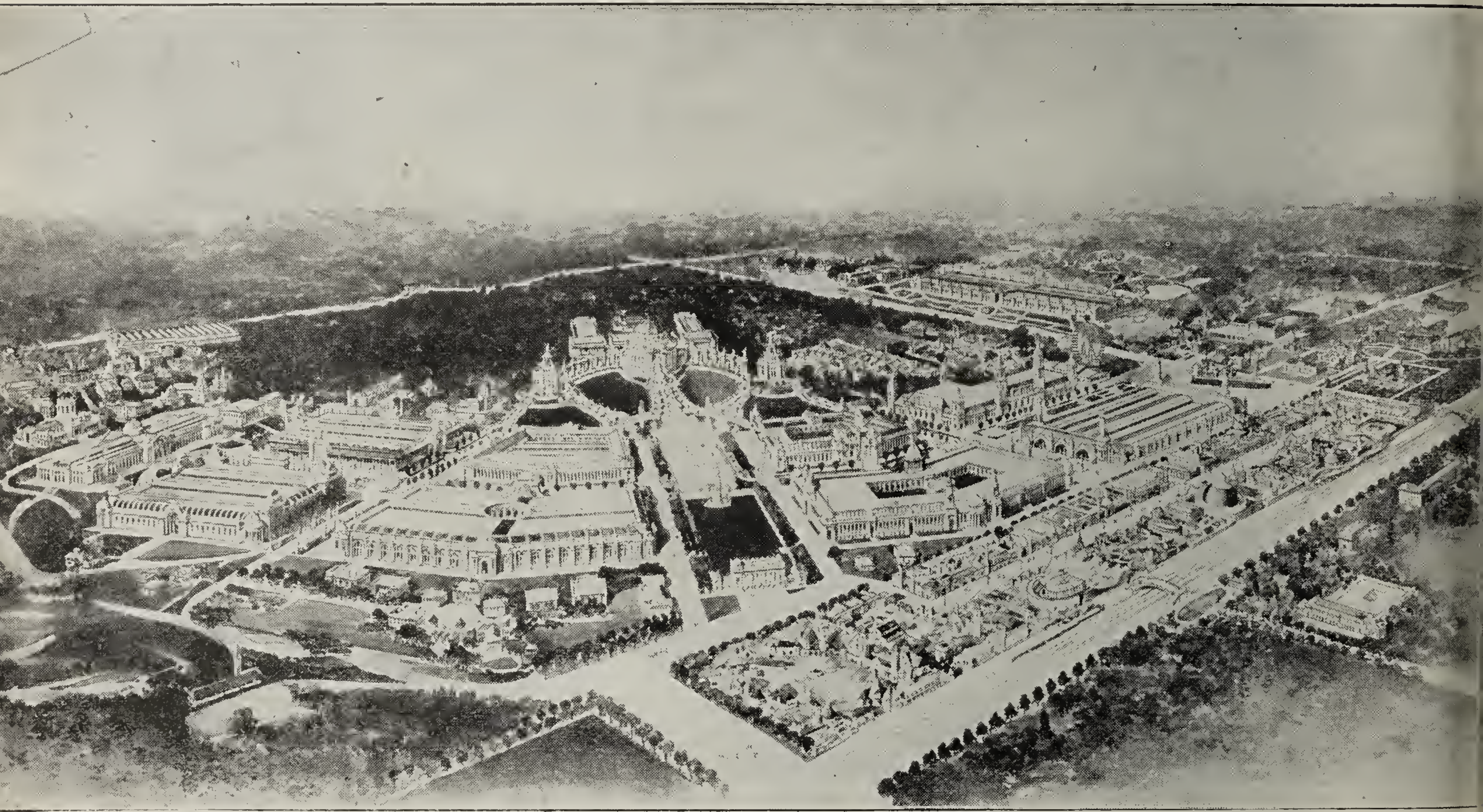
Main Entrance of Mines and Metallurgy Building, in Which is the Exhibit of Clay Products.

and no cement grout filler we realize that no other material, whether wood, granite, gravel or asphalt—and least of all asphalt—could have given us such a pavement as our photograph shows. Notwithstanding the most unfavorable conditions, this brick paving has successfully withstood the destructive traffic of heavy teams hauling building materials on the Pike.

Whatever the opinions and preferences of the exposition authorities might be, vitrified paving brick commends itself to them, for it possesses one advantage over its principal rival, asphalt, in the salvage. When the roads of the great World's Fair are torn up again, to restore Forest Park, as far as possible, to its original condition, the asphalt will have a very problematic value, but the vitrified paving bricks will be worth nearly as much as ever. They ought to be worth more, for they will be well tested.

VISITING THE CLAY WORKS OF ST. LOUIS.

Clayworkers visiting the exposition will want to see something of the plants that are successful in their own line of work. To make it easier to do this we have had the chief of our St. Louis editorial staff prepare a plan of the city, which we publish herewith. The locations of the plants are shown by the numbers on the maps, but the most useful part of the guide will be found in the instructions respecting the line or lines of street cars to be taken for the purpose of reaching any particular plant. This has been brought up to date and is accurate.



Birds Eye View of the St. Louis World's Fair.

The streets of St. Louis run, approximately, from east to west and from north to south. The most central thoroughfare, running from east to west, is taken as a dividing line. The streets running north and south are numbered from this central dividing line in each direction, so that it is important, when taking an address, to note whether the number is north or south. This central street starts at the river and stops at Forest Park. The first third of the street, from the river, is called Market street, the remainder of it is named Laclede avenue. The Union Depot fronts on Market street. While the streets running north and south are numbered from Market or Laclede in each direction, the numbers of the streets from east to west begin at the river and continue right on. The following are the directions for reaching the various plants indicated on our map. It should be noted that there are two street car companies, the Transit and the Suburban. The Transit is the principal company and serves the greater part of the city. One transfer can be obtained from one line to another on this system, but transfers are not given from the lines of one company to those of another. Where the name of the company is not given here the Transit is meant. The Transit Company's cars are painted yellow or orange; the Suburban cars are dark green.

No. 1. Blackmer & Post, Missouri Pacific and Arsenal avenue. Offices, Wainwright Building, corner of Seventh and Chestnut streets. Take Tower Grove car for works; starts at Broadway and Lucas.

No. 2. Brockschmitt Bros., 6533 Manchester avenue. Benton car of Suburban line.

No. 3. Christy Fire Clay Company, Morganford road and Gravois avenue. Take car on Market street marked "Southampton."

No. 4. Evens & Howard Fire Brick Company, Cheltenham. Office, 920 Market street. For works, Benton car on Suburban line from Broadway and Lucas.

No. 5. Fernholtz Brick Machine Company. Works and office at Manchester and Boyle avenues. Take Market street car.

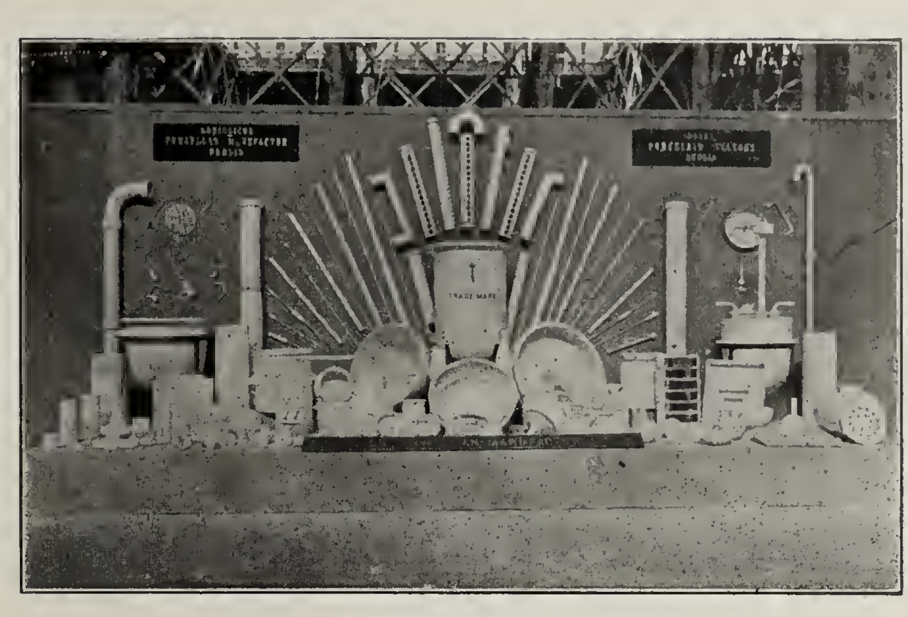
No. 8. Hydraulic Press Brick Company's main plants, Kingshighway and 'Frisco tracks. Office, Missouri Trust Building, Seventh and Olive streets. Take Olive street or Delmar avenue line and transfer on Taylor avenue south for works; this line runs on Kingshighway; or take Suburban car.

No. 9. Mitchell Clay Manufacturing Company, 5625 Manchester avenue. Benton car on Suburban.

No. 10. Mound City Roofing Tile Company, Morganford road and Fyler avenue. Tower Grove line; starts at Broadway and Lucas.

No. 11. Parker-Russell Mining and Manufacturing Company, Oak Hill. Office, 417 Pine street. Tower Grove car, or Oak Hill train on Missouri Pacific from Union Depot, 6:45 and 10:10 a. m.

The Center of Attraction Opening Day.



A Display of Foreign Porcelain.

Marvellous
Collections
of
Art
and
Industry.

Ceramic Art.

Gothic Art.

The
World's
Wonders
and
Man's
Triumphs.

The Brick-Paved "Pike."

THE AMERICAN CLAY WORKING MCH'Y. CO.
BUCYRUS, OHIO, U.S.A.

The First Completed Exhibit of Clay Products.

WORLD'S FAIR FEATURES.

Louisiana Purchase Exposition, St. Louis, April 30==December 1, 1904.

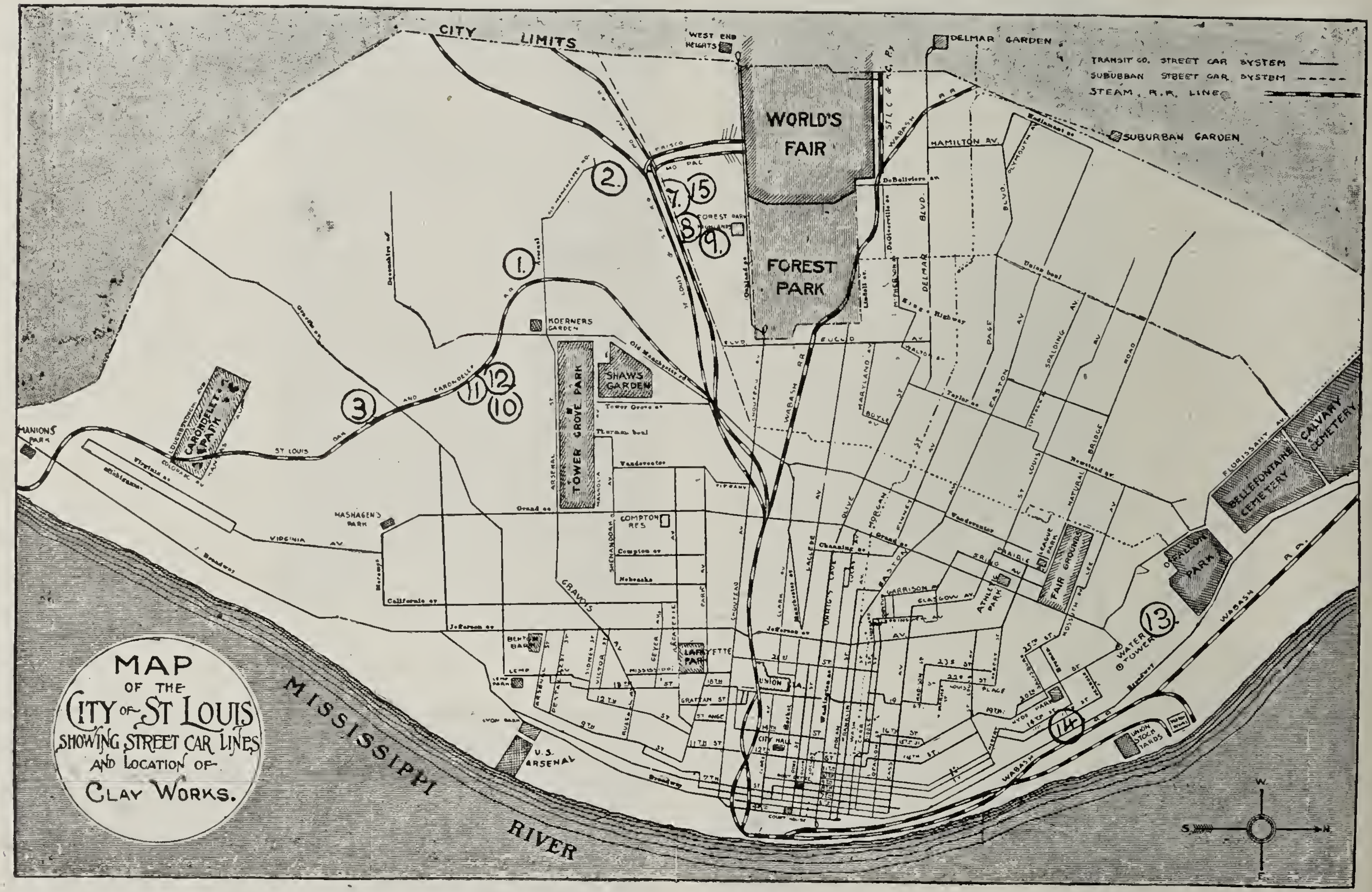
No. 12. Progress Brick and Machine Company, 3207 Kingshighway. Market street car marked Southampton.

No. 13. College Hill Press Brick Works (Kulage), 1400 College avenue. Broadway line north to Withers avenue; walk two blocks west.

No. 14. The Williams Patent Crusher and Pulverizer Company, 2701-2711 North Broadway. Broadway line car to 2701.

No. 15. Winkle Terra Cotta Company, 5735 Manchester avenue. Offices, Century Building, Ninth and Olive streets. The Suburban Company's Benton car passes works.

The manufacturers having offices in St. Louis are the Ross-Keller Triple Pressure Brick Machine Company, Fullerton Building, Seventh and Pine streets; Anthony Ittner, the brick manufacturer, whose plants are at Belleville, across the river. His offices are in the Odd Fellows' Building, at the corner of Ninth and Pine streets. In this building is also the Builders' Exchange, where visiting brick manufacturers may be sure of a hearty welcome. On the thirteenth floor of the Chemical Building are the offices of the McNeil Pressed Brick Company, whose works at Newbern, Ill., were illustrated in The Clay-Worker recently. On the same floor is the office of Prof. H. A. Wheeler, though that gentleman can only now be met at the Palace of Mines and Metallurgy, where he has charge of the collective clay exhibits.



BRICKMAKERS' HEADQUARTERS.

The real and legitimate headquarters of clayworkers will naturally be the space allotted to the National Brick Manufacturers' Association in the Palace of Mines and Metallurgy, within the very handsome enclosure of the clay exhibits, at the northeast corner of the building. Alongside the N. B. M. A. space is that of the official organ of the Association, where every visiting clayworker will be more than welcome. The Clay-Worker has some chairs and a lounge for the members of the craft, their wives, daughters and sweethearts to rest when tired from viewing the wonders of the show. There is also a desk and stationery, all of which they have the fullest right to use and consider their own.

EXHIBITORS IN THE CLAY INDUSTRY EXHIBIT OF THE ST. LOUIS WORLD'S FAIR.

THE HALF ACRE of space devoted to the clay industry of this country has been oversubscribed several times. There has been a number of changes, and while the following is the list on the opening day, April 30, there are still liable to be further changes, owing to the withdrawal, changes in location, etc., and a small amount of space is still available for desirable exhibits.

Most of the exhibits have been installed or are now being erected, though a few have not yet reached the World's Fair. It is expected that exhibits will be pretty well completed throughout the World's Fair by May 15, on which date the clay industry display is likely to be in a most attractive condition. Some of the exhibits are proving far more attractive than expected, and the exhibit as a whole is going to make a magnificent impression on the public and be of the highest value to the industry. While the raw material will be liberally exhibited, the real test of all clays or products made therefrom will be the principal method by which the clays will be exhibited, and the finished products decidedly predominate.

—Art Tile Potteries.—

Cambridge Tile Company, Covington, Ky.
Hartford Faience Company, Hartford, Conn.
Alhambra Tile Company, Newport, Ky.

—Art Pottery.—

Rookwood Pottery Company, Cincinnati, O.
Brouwer Pottery, of West Hampton.
Newcomb Pottery, of New Orleans.
Weller Pottery, of Zanesville.
Roseville Pottery, of Zanesville.
Teco Pottery, of Chicago.

—Terra Cotta.—

Northwestern Terra Cotta Company, Chicago.
Perth Amboy Terra Cotta Company, New York.
Excelsior Terra Cotta Company, New York.

American Terra Cotta Company, Chicago.
St. Louis Terra Cotta Company, Chicago.
Winkle Terra Cotta Company, St. Louis.

—White Ware.—

Onondago Pottery, Syracuse.
Owensboro Pottery, Owensboro, Ky.
Brunt Pottery, of East Liverpool.
Several East Liverpool potteries in the Ohio State exhibit.

—Stone Ware.—

Sherwood Brothers, New Brighton.
U. S. Ceramic Art Company, Monmouth, Ill.
Several Ohio potteries in the Ohio State exhibit.

—Enameled Brick.—

Tiffany Enameled Brick Company, Momence, Ill.
Hydraulic Pressed Brick Company, St. Louis, Mo.
Blue Ridge Enameled Brick Company, Newark, N. J.
American Enameled Brick Company, New York.
Sayre & Fisher, New Jersey.

—Pressed Brick.—

Hydraulic Pressed Brick Company, St. Louis.
Iron Clay Brick Company, Columbus.
Columbus Brick and Terra Cotta Company, Columbus.
Western Brick Company, Danville.

—Roofing Tile.—

Mound City Roofing Tile Company, St. Louis.
Celadon Tile Company, New York.
Alfred Brick and Tile Company, Alfred, N. Y.
Waco Mining Company.

—Fire Brick.—

Mitchell Fire Brick Company, St. Louis.
Laclede Fire Brick Company, St. Louis.
Mississippi Glass Company, St. Louis.
Missouri Fire Brick Company, St. Louis.
St. Louis Vitrified and Fire Brick Company, St. Louis.
Parker & Russell, St. Louis.
Fulton Fire Brick Company, Fulton.
Reese-Hammond Fire Brick Company, Bollivar, Pa.
Cyrus Borgner, Philadelphia.
Louisville Fire Brick Company, Louisville.

—Paving Brick.—

Purington Brick Company, Galesburg.
Alton Brick Company, Alton.
Western Brick Company, Danville.
Mack Manufacturing Company, West Virginia.
Malvern Clay Company, Malvern, O.
Nelsonville Brick Company, Nelsonville, O.

—Sand-Lime Brick.—

Huennekes Company, New York.
Schwarz Process Company, New York.

—Clay Machinery.—

American Clay-Working Machinery Company, Bucyrus.
Fernholtz Machine Company, St. Louis.
Williams Crusher Company, St. Louis.
Scott Manufacturing Company, Keokuk.

—Kilns.—

Carl Cebulla, St. Louis.
H. Haigh, Catskill, N. Y.

—Cones and Pyrometers.—

Orton Seger Cone Company, Columbus.
C. Englehardt, New York.

—Clay Exhibits.—

I. Mandle, St. Louis.
American Kaolin Company, Akron, O.
Bloomfield Clay Company, Metuchen, N. J.
Ohio Geological Survey, Ohio clays.
New Jersey Geological Survey, New Jersey clays.
Georgia Geological Survey, Georgia clays.
Kentucky Geological Survey, Kentucky clays.
F. E. Bausch, St. Louis.
Kelley Clay Company, Truesdale.
Ricketson mortar color.

—Clay Journals.—

CLAY-WORKER, Indianapolis, Ind.
Brick Builder, Boston.
Clay Record, Chicago, Ill.
Brick, Chicago, Ill.
Rock Products, Louisville.
Ceramic Studio, Syracuse.
Sprechsall, Germany.
National Brick Manufacturers' Association.
American Ceramic Society.

Written for THE CLAY-WORKER.

BRICK AND BUILDING NEWS OF THE WORLD'S FAIR CITY.

THE CLAY INDUSTRIES are quiet just now, although they have improved some recently. It looks as if the present conditions will continue for some time to come.

The completion of the World's Fair and the throwing out of employment of a great many laborers has not stimulated building. Those who contemplated building are holding off for a while with the hope that prices will go lower. As soon as these conditions exist there are prospects that a start will be made.

The scarcity of houses for residence purposes still continues. Houses of any kind bring good rentals, especially in the neighborhood of the World's Fair grounds.

The report of the building commissioner for April shows that permits were issued for building work estimated to cost $1,131,688.04. During April, 1903, permits were issued for work to cost $2,892,470.03. This shows a decrease of about $1,750,000 for April, this year, compared with April, 1903.

An employe in the offices of the Evens & Howard Fire Clay Company, Allen Kent Hanney, son of Colonel Hanney, of the United States Army, gave his friends a surprise a short time ago by announcing that he was married to Miss Katherine Lowe, daughter of General W. W. Lowe, of Omaha, Neb., last December. The ceremony was performed in St. Charles, Mo., while Miss Lowe was visiting in St. Louis. They will make their home in this city.

In the Nebraska Commission exhibit in the Palace of Mines and Metallurgy at the World's Fair are shown building stones, building blocks, etc. There is also a large collection of photographs illustrating the building industry of the State.

The Winkle Terra Cotta Company, of St. Louis, has a beautiful terra cotta pavilion of French design in the Palaces of Manufactures and Varied Industries. It represents four months' labor of skilled artisans. After the Fair it will be a feature of the restored Forest Park.

Prices of brick have changed slightly since a month ago. There has been a decline of 25 cents on merchantable brick, and it is now quoted at $7.25. There has been a drop also in strictly hard and red, and quotations on that grade are $8. Ordinary hard and red are now quoted at $7.50—a drop of 25 cents. Front red and stock are still quoted at $18 and sidewalk and paving at $10.

Efforts of incendiaries to destroy the plant of the Hydraulic Press Brick Company at Kingshighway and Manchester avenue within the past two weeks led recently to the arrest of three boys about eleven years old. On six different occasions since April 16 fire has been discovered on the premises. One of the boys stated, when arrested, that he started one or two of the fires simply for the desire to "have a good time."

William B. Ittner, commissioner of public school buildings, returned a few days ago from Europe, where he attended the International Congress of Architects at Madrid, Spain, April 6 to 13. Mr. Ittner said while in Spain he witnessed a bull fight, or, rather, part of one. He was so disgusted with the sight that he left the amphitheater before the fight was finished. Mr. Ittner read an illustrated paper on "Recent School Architecture in St. Louis" at the convention. He spent one day visiting the town of Toledo, an old Moorish walled city and the residence of the former Catholic Kings of Spain. Another day he spent at Alcala and Guadalajara. Madrid with 600,000 inhabitants is modernizing itself, Mr. Ittner says, to some extent. It is reconstructing its streets and buildings. In some sections it has laid out broad avenues and established entirely new street lines and boundaries. The same is true to some extent of Genoa, Italy, where the government has constructed a modern arcade and an underground theater in the center of the city.

The architects were accorded an opportunity to meet King Alphonse at the royal palace in Madrid. The convention was attended by about 600 professional men, 300 of whom were Spaniards and the others representing nearly all other countries of the globe. The next session will be held in London in 1906.

St. Louis, May 10, 1904. A SAINT.

Written for THE CLAY-WORKER.

THE MODERN CLAYWORKER. NO. 12.

ONE OF THE CONDITIONS which affects economy in burning most directly is drying. We often see a product which appears to be dry and contain so large a per centage of added water as to require several days' additional drying in the kiln and much fuel cost to the operation of water-smoking.

We will not attempt at this time to go extensively into the matter, but will say that for real economy a great deal of the water-smoking that is now done in the kilns, when the ware is dried in low-heat steam dryers or in sheds, by the natural method, can be more quickly and economically done in the fireproof waste-heat dryer.

It is no uncommon thing to see so-called "bone-dry," requiring four to five days to pass off the heavy volumes of mechanical water. Unfortunately the brick—and especially the tilemaker—has not the advantage in common with the laundryman, that their goods will freeze dry. It takes *heat* to *dry* clay ware. Air volumes alone will stiffen and harden, but for real drying heat must be added to circulation.

Given a clay calculated to stand economical drying, and ample cooling room, there need be no special limit set on the heat applied in the dryer, if kept within the limit which will not ruin cars. A really modern clayworking establishment has a waste-heat dryer, and most of them are the means of making money in a way that passes the present comprehension of the unenlightened. There are fortunate things about such dryers, not the least of which is that they are comparatively of low cost. Of course, to be entirely independent of the matter of having hot kilns to draw from, the steam coil should be present and so arranged that either exhaust of live steam may be used. Steam coils used in connection with fans should have stagger arrangement of pipes. A direct heat plan is often employed through an auxiliary kiln or oven, which is fired for the single purpose of supplying heat for the dryer.

One has to really study economy when considering this drying question—study not in theory alone, but investigate on the ground, so that results may be closely observed. One is apt to give more than passing consideration to the thought which comes when studying natural methods, "No fans to run; no firemen to pay." All of which is good in a measure, but hardly worthy of discussion from a standpoint of economy when considering equipment for a modern yard. The next style of dryer is the radiated steam, with stack draft, and the steam coil, with induced or fan, either of which may use exhaust steam. The question is, Which style offers the greatest economy? There is, of course, a direct means of determining this question—by using all or both side by side. Such demonstrations are unusual, though many manufacturers have used both kinds or styles. When considering the steam dryer in connection with fans we should determine whether there is an economy in using horse power in propelling fans in order to get large volumes of air, not highly heated, or in using this horse power in additional radiation and maintain circulation by means of high stacks.

The writer hesitatingly advances the theory that, as heretofore mentioned, velocity of air currents containing a small number of heat units does not thoroughly dry, but hardens and stiffens, leaving a large amount of mechanical moisture in ware which appears to be bone dry. In other words, high heats are absolutely essential in rapid and economical drying. The distributed radiation and stack power for circulation are, in the opinion of the writer, more economical in operation, and as affects burning or kiln water-smoking, than the fan and steam coil system. On the other hand, when the fan is supplied with superheated air of high degree from the kilns, the drying operation is at the present known heights of economy and which is carried beyond the economy of dryer operation to kiln operation and burning. Such fireproof dryers—and they should certainly be nothing else—are quite cheaply constructed and are of various systems adapted for use in drying all kinds of clays and wares, which forms may be fully seen in the plans of nearly all waste-heat dryer builders.

ST. LOUIS CLAY PLANTS.

AMONG THE MANY plants devoted to the manufacture of clay products in the St. Louis territory a majority of them are using machinery built by the American Clayworking Machinery Company, of Bucyrus, Ohio. Visitors to the exposition should take the opportunity of visiting clay plants, and while there should note the working of the American Company's machinery. The American Company will also have an exhibit of clay products made on their machinery and assembled from all parts of the country. This exhibit, together with machine models in operation, will be found in the Mines and Metallurgy Building, Block 20, Section "F." A representative of the American Company will be in attendance and every clayworker who calls will be given a souvenir. Among other plants in the St. Louis territory using machinery manufactured by the American Clayworking Machinery Company are the following. For the convenience of visitors who desire to see some special machine the names of the machinery in operation are given. The list is as follows:

—St. Louis Vitrified and Fire Brick Company.—

One Special Giant auger machine, manufactured by the American Clay-Working Machinery Company.

One oscillating automatic cutter, manufactured by the American Clay-Working Machinery Company.

Two nine-foot dry pans, manufactured by American Clay-Working Machinery Company.

Two No. 14 pug mills, manufactured by the American Clay-Working Machinery Company.

Two Eagle represses, manufactured by the American Clay-Working Machinery Company.

Two cup elevators, manufactured by the American Clay-Working Machinery Company.

One hundred and fifty dry cars, manufactured by the American Clay-Working Machinery Company.

And other machinery and appliances.

—Laclede Fire Brick Manufacturing Company, St. Louis, Mo.—

One Special Giant auger machine.
One No. 1 Giant auger machine.
One No. 20 rotating automatic cutter.
One oscillating automatic cutter.
One No. 29 pug mill.
One No. 14 pug mill.
One No. 2 pug mill.
Five Eagle represses, etc.

—Evens & Howard Fire Brick Company, St. Louis, Mo.—

One No. 1 Giant machine.
One Bucyrus automatic cutter.
One No. 6 pug mill, 14 feet long.
Two Eagle represses, etc.

—Mississippi Glass Company.—

One nine-foot dry pan.
Two long No. 14 pug mills, and other machines.

—Mitchell Clay Company, St. Louis, Mo.—

One nine-foot dry pan.
Mascot machine, and other machinery.

—Christy Fire Clay Company, St. Louis, Mo.—

One No. 1 Giant machine.
One board delivery table, and other machinery.

—Hydraulic Press Brick Company, St. Louis, Mo.—

One Mascot machine.
One No. 4 pug mill.
One No. 14 pug mill, and other machinery.

—Winkle Terra Cotta Company, St. Louis, Mo.—

Acme machine.
One nine-foot dry pan.
One No. 7 screw press, and other machinery.

The American Clay-Working Machinery Company also furnished the machinery for the plant of the Alton Paving, Building and Fire Brick Company, Alton, Ill. Also for the Banner Clay Works at Edwardsville, Ill., who have an office in St. Louis, and many other small plants near St. Louis.

LAND DRAINAGE

BY J. J. W. BILLINGSLEY

DOES TILE DRAINAGE PAY?

IN ANSWERING the above question we briefly refer to a few notable instances in the past history of tile drainage.

The late John Johnson, of Geneva, N. Y., bought a farm, largely on time, and his first crops of wheat gave him an average of only twelve to fifteen bushels per acre. He was a Scotchman lately removed to this country, and his hard Scotch sense taught him that he could never pay for his farm with such low averages of production. He determined to underdrain his land, being familiar with the benefits of underdrainage in his native country. He began with thorough work and advanced with it as fast as his limited means would allow. Much of it was done in the '40s. In a few years he was growing very satisfactory crops; in 1846 or 7 he grew the premium crop of wheat in the State, having a yield of forty-four bushels per acre, besides other crops of like excellence. He continued to underdrain until his entire farm was thoroughly tiled out. It is needless to say that he paid for his farm and accumulated money besides. A half century and more has passed since his drainage was completed, but to-day the farm has a fabulous rental value on account of its superb condition of soil and subsoil.

Robert J. Swan, also of Geneva, N. Y., being a witness of Mr. Johnson's success, purchased a farm of 300 acres, badly worn, and his first crop of wheat was eight bushels per acre. He was disgusted and determined to drain it, doing so at a cost of $22 per acre. The same forty acres that had a yield of eight bushels of wheat per acre, after being underdrained, had a yield of forty-six bushels of wheat per acre. The latter he sold for $1 per bushel, which more than paid the entire cost of underdraining the forty acres.

The late Dr. Townshend, of Columbus, Ohio, drained a field of retentive clay soil two rods apart, to the average depth of three and one-half feet, on which before drainage he had a usual yield of twenty bushels of barley per acre. After drainage he had a yield of forty-six bushels, the latter crop paying the cost of underdrainage, leaving a balance in the doctor's pocket.

A Mr. Dagger, of Newton County, writes: "In 1882 I drained a pond of three acres by putting in tile drains three rods apart. The result was that I raised 318 bushels of corn, an average of 106 bushels to the acre, actual measurement—the best corn I ever saw. I also tile-drained twelve acres of wet land upon which I had tried to raise corn for eight years, but never got a good crop. After drainage it averaged eighty bushels of corn per acre."

There are thousands of farmers in the States of Ohio, Indiana, Illinois, Iowa and other States that have had like satisfactory results from tile-draining their land. Therefore, we answer that tile drainage does pay and pays well if it is well done.

Putting Open Drains Underground.

Much has been done in the way of putting open drains underground, yet there is much more that needs to be done. To those who have had no experience or observation as to the amount of water that can be carried out underground through large tile it looks to be impossible, frequently, that so much water as may be flowing through an open ditch can be taken through any large tile. Yet it is true that systems of land drainage embracing many hundreds of acres have but one outlet through a large tile, the sizes ranging from 16 to 30 inches, as may be required. The writer had the pleasure at one time of standing at the outlet of a system of drainage that embraced 400 acres of level land, all being drained through a 16-inch tile. At the time of our visit the outlet tile was running about two-thirds full, and looking at the water spreading out into a natural stream below, it did seem incredible that it all could have come out of the outlet. A 20-inch or a 30-inch tile has the capacity of carrying little rivers of water.

Open ditches, at best, are only temporary expedients, and serve to carry away the water and furnish outlets for underdrains. From year to year they need to be cleaned out and kept in condition to do the best work. They afford a harbor for minks, muskrats and other pests. They need constant attention to be kept free from weeds, briars and small bushes, to say nothing of the lodgment of trash from overflows. Serving a good purpose, as they do for a time, yet they are greatly in the way of plowing and cultivating the crops, causing a great waste of time in turning and a fretful inconvenience in the use of harvesting and other farm machinery. The waste of land thus occupied is no small loss, besides, it gives a ragged, undone appearance to the farms.

When put underground, at one fell sweep a long list of worries and losses are swept away and the work of cultivation and reaping may go on unhindered.

One, if not the most important, reason why open ditches should be closed by putting them underground is the waste of fertility that goes on with each heavy rainfall, robbing the land of its most productive and nutritive qualities. The flow of water over the surface carries with it the light vegetable matter (the accumulation of the ages) into the open ditches and on to the larger streams, and is finally deposited in large bodies of water and forever lost to the needs of agriculture. Thus we may readily see that by draining with open ditches we not only lose the benefit of the valuable fertilizing elements contained in the rainwater, but in addition lose the other fertility, rendering our farmlands sad and unproductive as compared with what they were when first brought into cultivation. Where it is possible it is far better to be at the expense and trouble of putting the open drains into underground drains rather than suffer the loss and inconvenience of maintaining them as open drains through all the years to come.

A Work Not Appreciated.

A friend in Will County, Illinois, writes us as follows: "We have formed a union drainage district, embracing in part two townships. The land prior to this time has been drained to a small open ditch, which has proved to be a poor outlet. So by hard work we succeeded in forming a drainage district, but when it came to figuring up the cost of putting in mains and submains there was a terrible howl and everything but the open ditch was dropped, which is to be two miles in length. The open ditch is to be 20 feet wide on top and 12 feet wide in the bottom and 5½ feet deep. In one township there are nine miles of roadways that drain into this ditch; in the other township there are six miles of roadways that drain into the ditch. The one having nine miles was assessed for benefits to highways $75, the other $25. It is too small an assessment for either. Don't you think so?" (Yes, we think so; and more, it is ridiculously low.) "The open ditch draining the roadways also furnishes an outlet to drain the farms. A half mile of the open ditch is very crooked, and it has to be so on account of the hills, but the grade for three-fourths of the length of the ditch is six-tenths of an inch to the 100 feet. At the beginning three feet of grade was left in a distance of 350 yards. I write you for information as to the assessment for benefits and the question of grade."

The assessment for benefits to highways referred to by our correspondent is much below what it should be. Fifty dollars per mile would ordinarily be reasonable, and in some cases a much larger assessment would be right. The grade of six-tenths of an inch to 100 feet is small, so small that the open ditch will be likely to need frequent cleaning; the three feet left behind should be taken up and used to increase the grade through the entire length of the drain.

We note the fact, also, that the cost of sub-mains in providing for the future drainage of the lands was left off on account of the cost. This is a bad mistake. There will not likely be a better time to meet such an expense than now. Times are good and the outlook is very promising, besides, now is the time to provide for systematic, thorough work in the drainage of lands needing it through the drainage district in question. It is very probable that those who object to the expense now will regret in a few years that they failed to avail themselves of the advantage of laying the foundation for thorough work in the underdrainage of their lands. The benefits likely to result from a systematic effort to provide for thorough work in the drainage of the lands and highways of the district will probably pay the entire expense in two or three years after the work is completed.

Some Practical Suggestions.

In beginning the work of drainage one should have a comprehensive view of the extent of the undertaking—the area to be drained, the amount of water that will come from adjoining land that must be provided for, the best outlet or outlets, the depth of drains, and sizes of tile for main, sub-mains and latteral drains. The work should be carefully laid out, the inclinations marked on grade stakes, and the whole should be platted and preserved for future use. If it is not possible to complete the work soon, let what is done look forward to a future prosecution of the undertaking until it is completed. When the work ceases at any time the drains should be protected against any damage from washing in of dirt or trash, and mark where the stop is made, so that at some future time it may be taken up where it was left off and further completed. In this way the entire system may be completed, if it requires years to do it. In some instances we have known quite extensive and very complete systems of underdrainage worked out through the run of a few years without embarrassment, the land-owners relying almost wholly upon the increased crop production of the underdrained land to prosecute the work.

Those who begin the work of underdrainage to relieve the land of a pond or some surface water, or to drain a few wet places, with no idea of the extent of drainage needed are not likely to begin right or to prosecute the work further until they get a broader view of what could and should be accomplished by thorough work. The drainage of a pond or slough that afterwards grow from 75 to 100 bushels of corn on land that was practically worthless before for crop production, is very satisfactory indeed, but an intelligent, practical view of what may be accomplished by underdraining other lands that have not been considered wet lands, in order to get the water of rainfalls to pass down through the soil and subsoil and to give a good circulation of air through it, and in so doing increase the crop production from 25 to 50 per cent. on the whole area of land well drained, is still more satisfactory. Such work appeals to our better manhood, higher intelligence and better efforts.

Had to Turn Away Buyers.

Editor Clay-Worker:

Enclosed find $3.00 for which please send me The Clay-Worker for another year, also one of your Post self filling fountain pens. Please send me a good one, it is for my father and will have to work to satisfy an old man 80 years old.

I see by your postscript that you have had the best year you have ever had. I am glad to hear it. Here the same, I could not fill the orders for tile and brick at all, as fast as they came in. I had to refuse lots of them. I employed more hands this year than even before. I am not a brick manufacturer, but when it comes to making brick and tile I try and make the best I can out of my clay and a proof that they are all right, is that I sell my goods in competition to Bloomington and Kankakee. My tile and brick go down the I. C. R. R. within a few miles of Bloomington and within nine miles of Kankakee. The only trouble is I cannot supply them fast enough. On the L. P. & W. road I send them to La Harpe, 10 miles east, and west to Griley, Seacor, El Paso, Chenoa, Weston and Fairbury, so you see when it comes to making good stuff I am not so small a Dutchman after all. I guess by the time we have burned 100 kilns of tile and brick and have dirt enough housed to run all winter, we will commence molding tile again right away. Geo. J. Walters.

Chatsworth, Ill., Dec. 29th, 1903.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

The Clay-Worker a Great Deal of Help.

Editor Clay-Worker:

Gentlemen—Find enclosed $2 for another year's subscription to The Clay-Worker. I found it a great deal of help to me last season, being a beginner. I am building a down-draft kiln this spring, think they are the proper thing where fuel is high, as it is out here in the short grass country. Brick has always been burned here in clamps with $7.00 coal, and in a down-draft kiln we can burn cheap coal and get better results, according to my way of thinking. Alton Gregory.

Larned, Kansas.

A New Style of Steam Shovel Needed.

Friend Randall:

For several years past I have been receiving letters and cuts from the manufacturers of steam shovels. No doubt they are great labor savers where conditions are right for their use. For us brethren in the South who use clay from the river bottoms we need a shovel of a different pattern, one that would work from the surface downward is what is needed. Many of the clay beds rest on quicksand, many of the clay pits are filled with water from overflow which is gotten rid of either by ditch or pump. The beds run in depth from eight to twenty feet.

Publish this so that some of your readers who are blessed (?) with an inventive mind may plan such a shovel as will be much help to many who are barred from using anything but the primitive pick and shovel.. J. W. McMillan.

Milledgeville, Ga., March 29, 1904.

A Missourian Wants to be Told of a Desirable Location for Brick Plant.

Friend Randall—Enclosed please find New York Exchange for five dollars to pay for The Clay-Worker for another year and membership dues in the N. B. M. A.

You will notice that I got the exchange January 22d, aiming to send it to you but did not as I thought a few days before the time for the Convention I was going to be able to go to Cincinnati, but I failed to make connection. I was very sorry I could not be there as I am sure everybody had a fine time who did attend.

Bro. Randall, I was very much shocked the other day, upon receipt of The Clay-Worker to find there, between dark heavy lines, the noble features of your fellow-townsman and brickmaker to the president, who is now no more. I could not do otherwise than regard him as one of the greatest men of our Association and think we could not do less and think it appropriate that we prefix to his name, "The Lamented" brickmaker to the President. I had not heard of his illness at all, hence my great surprise. Of course, he was greatly missed at the convention and of course suitable resolutions and condolences were passed by the convention.

Mr. Randall, do you know of a first-class opportunity for a man to take hold of the brick business. I may sell out here and if so I may want to go some where, where there is an opportunity to get my two sons into business where they would have a reasonable showing for making some money, and thought it no harm to ask this much.

I wish to congratulate you, Mr. Randall, on the very fine issue of The Clay-Worker for January. I regard it as the finest issue ever gotten out by yourself or any other trade paper.

Carthage, Mo. I. C. Wheeler.

A Scarcity of Labor in Mississippi.

Editor Clay-Worker:

Enclosed you will find check for renewal to The Clay-Worker. I don't want to miss a copy. It is a great journal. We are not running yet this season on account of scarcity of labor. We are offering higher prices than before, but the new railroad which is coming through has every available hand to be found in this part of the country. There are no loafers here.

Success to The Clay-Worker. M. P. S. Berry.

California Brickmakers Prosperous.

Editor Clay-Worker:

Enclosed please find money order for subscription to Clay-Worker. Our company, the Holt & Gregg Company, will have to run their plant at 36,500 brick per day every day this season in order to supply the demand, owing to large contracts with the Diamond Match Company at Chico. We are burning the first kiln this season with 250,000, which is very small. We usually burn 600,000 to 800,000, but the season has been so backward we could not wait for a larger kiln. There are some parties going to start a stiff-mud plant near Chico, but cannot give particulars yet. We use the rack and pallet system, with a Potts outfit, and put 36,500 brick per day in the kiln with twenty-five men and four boys. J. T. Black.

Burning Tile in a Common Brick Kiln.

Editor Clay-Worker:

I note in the last number of The Clay-Worker that J. A. Foglesong wants information about burning and setting tile in a kiln of brick. The way I do it is to set the arches and heads and outside of the kiln just the same as if for brick, set about five courses of brick above the arch and two or three brick deep on the heads, then nest the tile to set the small tile inside the large ones. Keep them as close together as possible. I cover the top with one or two courses of brick set a little more tight than in a brick kiln. Plat the top tight, leaving openings by taking up every fourth brick to let the water-smoke escape, putting them down after the kiln is clear and when the tile get red or after the water-smoke is gone, cover the top with mineral wool. If you do not have it, cover with fine clay or loam, the latter makes lots of dust, but it does the *biz*. If there is not draft enough in certain spots, scrape away the clay and lift up a couple of brick, or the mineral wool if that is used. You can have certain spots on top that you can open and close. When you set the tile put in the kiln under those places that you open three or four pieces of broken tile with a hole in it so you can reach down with an iron hook and take out one of the pieces from time to time and it will give you an idea of how near done your kiln is. Tile can be set in any part of the kiln, but if you burn brick in the same kiln, care should be taken to set the brick course next to the tile tighter than ordinary or the tile will steal the fire from the brick kiln part having more draft which must be kept under control, otherwise burn just the same as you burn a kiln of brick. Cross-fire, etc., close up kiln tight until cool. J. D. P.

The Color Question in Masonry.

Editor Clay-Worker:

We are frequently asked relative to the best method of coloring artificial concrete building blocks; manner of mixing, etc.; what action, if any, the coloring matter has on the strength of the material manufactured; quality of color required.

First. The writer has been manufacturing colored building blocks, using Ricketson's Red Mortar Color, manufactured by Ricketson Mineral Paint Works, Milwaukee, Wis., for the past five years with success. We find it necessary to use the color quite strong, as action of the cement lightens the product considerably when it is entirely dried out. We find that it requires about two pounds of this coloring to ½ cu. ft. of solid concrete to obtain a good strong red Portage Entry or red Bedford stone color.

The manner of mixing to get best results is to mix the coloring with cement dry, then add this mixture to sand and gravel in the regular way. This coloring matter being oxide of iron product, it amalgamates with the cement and adds more materially to the strength of the concrete.

We are frequently asked if this coloring matter fades. We answer, "No." Of course, the blocks should be colored very much deeper red when they are originally made and still moist than is to be required with block when thoroughly dried out. This varies somewhat in the different cements. However, a little judicious experimenting will put the operator in a position to determine the amount of material required to manufacture his blocks.

The writer would suggest that it is to the advantage of the manufacturer to use a two-piece concrete block, as in this case only one-half of the entire wall or the front need to be colored.

Had almost forgotten to mention that we are frequently asked relative to the alkali exudation that sometimes appears in the plain and colored cement building blocks. We find that this is very much more apparent where the blocks are manufactured with a 1-to-1 or 1-to-2 facing material, as this mixture carries more cement and consequently more sulphate of lime than the blocks that are made of a mixture of fine sand and cement 6 and 7 to 1, which we have found is the better way of making blocks.

Should any of your readers desire further information on this matter, we will gladly furnish it.

National Building Block Co.

Milwaukee, Wis., May 4, 1904.

From 'Way Down in Maine.

Editor Clay-Worker:

The outlook in Eastern Maine at this writing (May 1) is not promising. The weather is raw and threatening, but produces neither the promised flood nor the necessary warmth.

But what the weather lacks in the latter quality is more than supplanted by the labor unions and masters' unions. Organized labor, not satisfied with its victories of last year, which included a nine-hour day and a rise of 25 cents a day in pay, this year flung down the gauntlet and declared war for an eight-hour day and a rise of 25 cents a day more—and the result is extreme warmth, not only on the part of the employer and employed, but on the part of every man who has the welfare of the community as well as the laborer at heart. Labor unionism here seems to be displaying in an emphatic manner the one weakness that is bound to destroy it in the end unless cured, and that weakness is the misuse of power, the utter disregard of all responsibilities or consequences while pursuing the prize of higher compensation.

The spectacle in Bangor is nothing short of disgusting. After nearly six months of winter idleness, and just as plans for the summer's building were being formulated, came the announcement that the masons, the mason tenders, the carpenters, the plumbers, and every other union or journeyman mechanic, would demand an eight-hour day and a rise in the wage scale.

The result was emphatic on the part of the employers. Every master concern in the city locked its doors against union men and dared the unions to battle. It was a throw-down for the unions and threatens to destroy every labor organization in this section, for one by one and in groups the men are deserting and going back to work on last year's scale.

In the meantime, however, a greater shock has been given to industrial circles by the actions of the unions than had the town been swept by fire. Building ventures are reduced to those projects which conditions absolutely compel carrying out. The fault of the unions in this is traceable, as is usual, directly to the leaders. The chief leader here, a second-rate carpenter in his best days, but a glib orator, has been by turns a temperance ranter and organizer of dark-lantern societies for years past. The wave of unionism rolling east found him chief organizer of a secret body whose whole aim was trouble and disorder, and that body waning in popularity, left its idol high on the beach to be caught up by the succeeding wave of popular feeling. It is hoped that the rapidly-nearing defeat of his latest engineering feat may turn him back to the cause of temperance or his rusty kit of tools.

Unionism has driven from business one of the most generous and kindly friends that the laboring man ever had in this section and has closed a place of industry that in the past generation has distributed many thousands of dollars to the working man. It was not that Mr. Holyoke was not a friend of the unions, it was not that he refused to employ union men, it was not that he ever by word or deed deliberately antagonized the unions. It was simply this: Sam Holyoke's yards were situated in Brewer, where there are no labor unions. The teamsters of Bangor had a labor union and Holyoke had employment for one teamster. Now, he could not get a man who would stick to the team for any length of time. In fact, he had a dozen teamsters in as many weeks. Yet the unions of Bangor insisted that Sam Holyoke's teamsters in Brewer should be union men. They didn't offer to admit these teamsters free of charge and they didn't send any union men to drive the team. Holyoke could not see why they should expect him to pay the expense of initiating his untried team drivers into the union, not knowing whether the man would remain one hour or one week. Yet the union insisted that Holyoke must employ a union teamster, and when he couldn't do it they boycotted his bricks.

Holyoke simply withdrew from business and left the unions alone in their glory. Holyoke has enough to live on without making bricks, but some of his brickmakers of former years regret his withdrawal.

Another veteran withdrawing from business after over half a century's continuous brickyard operation is Henry A. Morrell, of Pittsfield. The son of a veteran brickmaker, Mr. Morrell has worked at the business since he was ten years of age. For twenty years he has operated a yard at Pittsfield and has made a quality of common brick unsurpassed by any made, unless it were those made by his brother, William Morrell, of Gardiner.

Both Mr. Holyoke and Mr. Morrell are types of the original Yankee manufacturer whose work was well done, whose yards were neatly kept and whose products showed the care expended in every stage of their creation. The good old type is rare in these days of eight-hour movements, haste and unionism. The difference between the two generations can be plainly read in the bricks they have left behind them.

William Burke is slowly recovering from a severe attack of pneumonia. His yards will be operated this year by his son, William, Jr., who has been for several years manager of the plant.

Hugh O'Brien will begin manufacturing bricks as soon as the fog lifts.

John McDonald, formerly foreman for S. A. Holyoke, will start a small operation in the old Dunn yards, off Chamberlain street.

Pope D. McKimm and Sherman A. Sutherland are considering the matter of starting a brick plant at Newport.

At Caribou the writer has been called to map out a small yard, and still another concern is talked of for the territory near Stockton Springs. At Stockton Springs, twenty miles below Bangor on the Penobscot River, is a natural open harbor. The Bangor & Arvostook Railroad has bought the land and will push its line down to connect with a line of steamers, transatlantic and otherwise, and in this source great expectations are harbored.

It is a moving time.

At Bluehill a company has undertaken the work of reviving the abandoned copper mining works and will install a system of treatment of the rock that will utilize the natural gases of the stone in liquifying it and extracting the various ores, copper, silver, lead, etc., and finally the refuse while still molten will be pressed into paving blocks.

But for the strikers Maine would simply fly. B. J. D.

Bangor, May 2, 1904.

Virginia Brickmakers Busy, Despite the Presidential Campaign.

Editor Clay-Worker:

We enclose check for $2, subscription to The Clay-Worker. The brick business continues lively and the demand for brick is good. This is one presidential year when we believe business is going to be more active and better than usual. This place being in the center of the tobacco belt, is steadily growing. The American Tobacco Company has just completed a very large block of three storage houses, a long tobacco warehouse is going up, also several stores and dwellings.

Wishing you continued success, Boston Brick Company.

Clay-Worker a Valuable Asset.

T. A. Randall & Co.:

Gentlemen—Enclosed find our check for $2 for one year's subscription to "Clay-Worker." We find your paper a valuable asset in our business and you will find us a steady subscriber as long as we remain in the brick business. We are making brick here twelve months in the year at this point as we have no freezing weather that hurts our brick. We use the dry press system and placed upon the market in 1903, 3,000,000 brick at an average price of $7.15 per thousand. The entire product of our plant was shipped out by rail, as our home demand is very limited. We have great faith in the future of this country and believe it will only be a short time when we will be compelled to increase the capacity of our plant.

Yours very truly,

J. L. Evans Press Brick Co.

Addington, Ind. Ter.

THE TEXAS SITUATION.

Editor Clay-Worker:

After many months' silence owing to other work requiring my attention, I will try to give you some news of this oil town.

Beaumont, as most of the world knows, is in east Texas, on the banks of the Nechez river, and about twenty-five miles from the Gulf of Mexico.

Spindle Top, the greatest oil pool yet discovered in America, is four miles to the southwest of the city. Here three years ago a world-renowned oil well was found at a depth of 1,050 feet. The picture herewith gives a good idea of the appearance of this Lucas well at the time. Now only a pipe sticking out of the ground with no rig over it, marks the spot where once an ocean of oil spouted into the air hundreds of feet high. Since the Lucas well was brought in, about 1,000 other wells have been drilled on Spindle Top proper. Many were gushers, others only pumpers. Today, after three years and forty days (to be exact), there are perhaps 100 wells under the pumping process, with a total production of less than 15,000 barrels per day. This oil is now quoted at 32 cents per barrel at the wells. Hundreds of wells have been drilled in surrounding territory. Sour Lake, 20 miles to the northwest, was opened up on a large scale last June, although intermittent attempts had been made several years before to develop that field. Several hundred wells have been completed during the past summer, many of them very large ones; but here, as at Spindle Top, excessive drilling has ruined the field and today it is "On to Batson Prairie," 16 miles still further west, where at this writing the largest oil wells in the world are being found. Of course, with so much oil in prospect, the market is low and any price almost is accepted by those who have no pipe-line facilities or storage tanks. This latter field being so far from the railroad it requires hundreds of teams to transport the heavy machinery needed to operate the wells. But you can't stall an oil producer; it matters not what obstacles are in the way, they simply overcome them by push and cash.

Beaumont, before the Lucas gusher came in, was a town of about 5,000 people, mostly engaged in lumbering, there being vast forests of yellow pine up the river to supply the large mills here in the city. Within the past two years the city has grown to about 20,000 people, and with most of the modern improvements—electric railroad, electric lights, sewers, paved streets and many beautiful buildings, mostly of brick. Of course this was a natural consequence of the rush and boom, the discovery of oil at Spindle Top.

Building after building was projected, and before the foundations were laid in many of them they were rented at fabulous prices. Within the past year these rents have become a burden to many storekeepers. While business of all kinds is good, it is not on the boom. Beaumont will be the natural center of this lower oil field, as many railroads center here, making a good base of supplies. All the oil-well supply companies have supply houses here, and anything from a nail to a boiler and engine can be had on short notice.

Just at this date we are having our second day of rain, the first of any account since last July. The weather has simply been out of sight, and peach trees are now in bloom, as are other fruit trees.

I enclose you pictures of some of the most prominent buildings. The Opera House cost over $125,000; the postoffice building, as the picture shows it, has recently been enlarged to double its old size. This is of buff brick first story and red pressed brick two upper stories, with buff trimmings in terra cotta and limestone base. The Opera House is also of red brick. Pearl street, the principal business street, is lined with fine buildings. The Gulf National Bank building being of a gray brick. Some few are built of brick and covered with cement. Among these are the Keith office building, five stories high; also the Temperance Hall building, in which is located the American National Bank. Pearl street from end to end is paved with brick, as is Orleans street on the west and parallel to Pearl; Calden avenue, the most beautiful street in the city, has just been completed and paved with brick west as far as the Santa Fe Railroad tracks. This avenue has many beautiful cottages and much wealth is displayed in the erection of handsome homes, but all are of wood, as is also "The Oaks," a very large wooden hotel on this same avenue. "The Oaks" is named after a beautiful grove of oak trees in this section of the city.

There are brickmaking establishments in and near the city, but up to the present time the writer has had no opportunity to visit them. There is no lack of clay in this part of Texas, as witness the unpaved streets after a rain like the present one. Last year, I am told, before the streets were paved, and during a rainy season of ten months, many wagons were buried beyond help in the mud and stood for weeks in the principal streets.

Since leaving New Jersey we have traveled through most of the Southern States. Each one seems to have some advantages. Texas, with her broad domain, doubtless leads all others. In oil alone she will produce millions of dollars. Being near the seaboard she can ship fuel oil to the world. Rice growing is also beginning to be a permanent business. Last year's crops were immense, and owing to the favorable harvest weather it was all saved in good shape. Many people from the North are settling in the Gulf territory, and taking up this branch of the industry. The climate is perfect, there has been no snow during the winter and hardly enough frost to burst an exposed water pipe.

The Houston papers lately have spoken of the prospect of the erection of a pottery there for the manufacture of porcelain and white ware from kaolin found south of that city. We sincerely hope they may be successful; but an intimate friend, who probably knows more about kaolin than any other man in America, turned the same kaolin down as not good enough for his customers. Kaolin has been found in many Southern States, but none as pure as the Edgar clays from Florida.

Our better half who sits by as we pen these lines, does not like Texas. But as she has been simply a trained nurse for a daughter ill for the past few weeks with typhoid fever, of course she feels blue, but they can both congratulate themselves upon the fact that the thermometer did not get down to 22 degrees below zero like it did this winter in our New Jersey home. They are now scrapping with your correspondent over the date of their return. We expect to stay in the South another summer at least and then settle down for good in New Jersey, the finest land of all.

W. R. Osborne.

New and Valuable Clay Deposits in the Keystone State.

Editor Clay-Worker:

Recently vast deposits of fine clay have been discovered in and around Mount Jewett, Pa., the town being located at one of the highest points in the State, being 2,300 feet above sea level. Consequently the clays found in that altitude are all of the finest quality and white burning, comprising the purest white flint clays, porcelain or potters' clay, fine clay for terra cotta, etc. No such deposits of clay have been found in the State of Pennsylvania heretofore. These clay beds average not less than from forty to seventy-five feet in thickness, with not over two or three feet of soil covering them. Expert opinion is unanimous in declaring this clay to be of the purest quality.

The proximity of these clays to the railroads makes them doubly valuable for manufacturing purposes, and it is predicted that in the near future Mount Jewett will be a bustling center for the manufacture of all kinds of high-grade fireproof products.

H. J. Corell.

SOMETHING NEW IN BRICK KILNS AND BRICK DRYERS.

We beg to call attention to the advertisement of Mr. F. W. Dennis, Atlanta, Ga., appearing in this issue on page 645, of his Double Chamber Up and Down Draft Brick Kilns and Direct Heat and Hot Air Brick Dryers.

It is not generally known that down draft kilns can be constructed large enough to hold a half million of brick, but these kilns are constructed to hold any amount up to a million or more of brick. Mr. Dennis already has in operation three kilns ranging from 350,000 to 600,000 capacity, which are in operation and are giving perfect satisfaction. He has just finished building one for the Capital City Brick Co., of Atlanta, Ga., with a capacity of 500,000 brick. These kilns are undoubtedly the largest down draft brick kilns in operation in the world. He has contracted to build two more for the same company as above, which is proof of their merit. Mr. Dennis has also built two of his latest improved Hot Air and Direct Heat Brick Dryers, which are in operation and a complete success, and has contracted to build two more of these dryers. These new inventions should prove of great interest to all practical brickmakers, as they are a demonstrated success.

Mr. Dennis would be pleased to furnish booklet with illustrations, giving full particulars and information regarding these kilns and dryers.

PATENT SUIT.

Suit was brought Feb. 23, 1904, against the Hamilton Brick Co., of Hamilton, Ohio, by the Horton Manufacturing Co., of Painesville, Ohio, for infringement of their patent on their Hercules brick machine. The Hamilton Brick Co. is using a machine made by the Arnold-Creager Co., of New London and Cincinnati, Ohio, and is called by various names such as "S. S. S.," the "New Century," the "Success," etc.

5 tf L.

A NEW WEST VIRGINIA BRICK COMPANY.

The Parkersburg, (W. Va.) Impervious Pressed Brick Company is the name of a new corporation which is being organized for the purpose of manufacturing an impervious red pressed brick of the highest grade. The plant will be equipped for a capacity of 300,000 per day and will be located just outside the city limits on the line of the Baltimore & Ohio R. R. An option has been taken on 35 acres of ground and which is practically a mountain of shale on the same vein which is now being worked by the U. S. Roofing Tile Company, and has been tested and pronounced second to none. The company will be incorporated with a capital stock of $50,000, and with a paid-up stock of $30,000, which has been nearly all subscribed. The equipment for the plant will be ordered in the near future. Thomas Shaw, Dr. H. B. Price and W. H. Patton are interested in the plant which they expect in running order by the first day of July.

DO BRICKMAKERS HAVE MONEY TO BURN?

A great many brickmakers must needs answer the above question in the affirmative. At any rate, fuel bills form a large part of the disbursements of clayworkers generally. Some there are among the progressive manufacturers who have found that they can materially lessen this drain upon their resources by adopting a more scientific method of generating their steam power. A case in point is that of Mr. R. G. Eisenhart, Horseheads, N. Y., ex-president of the N. B. M. A., who like many of his associates thought he was practicing due economy in the operation of that part of his plant, but on trial finds that he was really "burning money" needlessly. Early this spring after careful investigation, he installed the Parson system, and after using it for several weeks, writes of it: "We are now using a cheap grade of coal and get as good results as we did previously with a high grade of coal. Not only has the Parson system reduced the cost of fuel for us, but we find that our fireman has less work."

If, Mr. Clayworker, you would do as the sage of Horseheads has done, stop "burning money" unnecessarily, investigate the Parson system, which is advertised on page 657. Write the Parson Mfg. Co., mentioning The Clay-Worker, and they will tell you all about it.

SOME GOOD PHILOSOPHY REGARDLESS OF CREDIT.

In their ad on page 586 of this issue the Scott Manufacturing Company, Keokuk, Iowa, credit Benjamin Franklin with the wise saying, "Be sure you are right, then go ahead." In all likelihood "Poor Richard" made the remark attributed to him, on various occasions, but as a matter of literary history the quotation is usually attributed to Davy Crockett. This is admitted by Peter B. Gibson, secretary of the Scott Manufacturing Company, the writer of the ad., who says he suspected it all the time, but that his admiration for Franklin in so great that he loves to do him honor on every possible occasion. "Peter" admits that the joke is on him, and says he will "buy" when opportunity offers, which evidences his good-heartedness, for he might easily have said, "It is my mistake and your treat."

TRADE NOTES.

William G. Dove, Geneva, N. Y., is erecting a steam-power plant of 50,000 capacity, which will be up to date in every particular. The entire equipment is being furnished by the Eastern Machinery Company, New Haven, Conn.

The Williams Patent Crusher and Pulverizer Company is serving notice on their friends that their Chicago office has been moved from 225 Dearborn street to Suite 545 Old Colony Building, which is two blocks farther south on Dearborn street. Visiting clayworkers will be welcome at all times.

The Hydraulic Press Brick Company, St. Louis, is sending to their friends throughout the country—and their name is legion—a handsomely engraved card, bearing the following invitation: "The Hydraulic Press Company extends to you a cordial invitation to use its offices, twelfth floor, Missouri Trust Building, as headquarters during your visit to the Louisiana Purchase Exposition, 1904. Writing materials, telephones and the services of stenographers will be provided and arrangements made to receive and care for mail."

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

VOL. XLI. MAY, 1904. No. 5.

CURRENT COMMENT.

Wait until the Japs beat our World's Fair before becoming alarmed by their power and aggressiveness.

* * *

A Russian victory or two would at least have the advantage of stopping the idiotic drivel about the "Yellow Peril," in which not a few are now indulging.

* * *

The "Yankees of the East" are proving to all the world that they are a remarkable people. Their exhibits at the World's Fair alone are evidence of that, but it is significant that they have only copied our inventions without surpassing them.

* * *

It will be a very long time before China can force us to receive missionaries to convert us to her various isms and compel us to admit every Chinaman that chooses to come here, while she shuts her ports to us in every way and maintains an American exclusion act.

* * *

As the exhibits are completed, one after the other, the clay industries as represented in the Palace of Mines and Metallurgy are showing that they will certainly be one of the most interesting and valuable departments in the whole exposition. If the classification of exhibits had been less clumsy and illogical, all clay products would have been shown together and would have made a very imposing spectacle.

* * *

The Paving Brick interests were represented at the Good Roads Convention by a large and able delegation of the Indiana and Illinois manufacturers. The latter was headed by W. S. Purington, Galesburg, President of the N. B. M. A., who attended every session. Vice-Pres. W. P. Blair, of Terre Haute, Ind., and Sec'y T. A. Randall, of Indianapolis, were also in attendance. All drank copiously at the font of Good-Roads' wisdom. Afterwards they viewed the wonders of the Exposition, not failing to visit some of the amusements on the "Pike." Messrs. Purington, Blair and Matson were accompanied by their wives. The latter voted unanimously to accompany their husbands on each succeeding visit to the Fair.

OUR GREATEST ACHIEVEMENT.

Since our last issue the event of events, the opening of our great World's Fair, has gone into the history of accomplished facts and crowned with all the glory of full success. This greatest of all world's fairs, in being, perhaps, the greatest that will ever be, owes no little of its splendor to the friendly co-operation of many foreign nations, and the evidence and recollection of this is doubly gratifying as proof of the regard and good will which all nations bear for the United States of North America. In bringing to one great center, from all corners of the earth, the highest efforts of genius in science, in art and industry, we have an object lesson that every one should study and profit by. We need make the most of the six and a half months that remain to us; only twenty-six weeks, that will pass by very quickly and the opportunity will be gone. We cannot make too much use of our object-lesson. Other nations will certainly use it, for the brightest minds and acutest observers will come to see the best that we can do and compare it with their own. We shall at least have universal reciprocity here, and the Louisiana Purchase Exposition will be a veritable mart of intellect where the best products of mortal minds and hands may be compared, copied and improved upon.

ADVANCE OF THE GOOD ROADS MOVEMENT.

The National and International Good Roads Convention, which was held in the World's Fair city May 16th to 21st, was all that the name implies, and called together many notables from distant parts of our own country and a number of distinguished gentlemen from Canada and other foreign countries, each and all of whom evinced an enthusiasm which augers well for the ultimate success of the good roads movement. Those having in charge the work of organizing and promoting this movement may well congratulate themselves on the great good accomplished. It would appear at first thought that every one must agree that we ought to have and must have good roads. Statistics may tell us how many millions of dollars we lose every year through the present condition of the public ways, but our common sense alone, without the exact figures, will be sufficient to assure us that the loss must be very great, and there are far too many opportunities for experience to teach us how great is the personal discomfort. With all this it seems surprising that the country should for so long have tolerated the existing condition of things. The rapid growth of the United States may, in some measure, account for much of the neglect. In the early pioneer days, in a sparsely settled country, the building of good roads is a costly proposition that cannot be thought of. The result is that when the country becomes settled our farmers are accustomed to a condition of things which ought to be intolerable, though this would soon be remedied but for one thing—the item of cost.

THE FALLACY OF OUR PRESENT SYSTEM OF ROAD-MAKING.

Every man will readily subscribe to the theory that the roads throughout the land ought to be in good condition, but he has a natural disinclination to pay for them or to build them himself. Yet they must be built and they must be paid for, and how best to do this has been the subject of many experiments and of repeated failures. Of all the methods that have been tried it is generally conceded that the very worst is the road-tax system, where the farmer contributes his share by two days of ill-directed and indifferent labor. As the case stands, we find that there is still need for very much educational work, both economical and technical; economical, as to the best way of accomplishing the object, and technical, as to the best way of building the roads. The almost unanimous opinion is that no help can be got under our present imperfect systems and that our only salvation is to be found in State and national aid. If the State and the Federal treasuries provide the money, the control of the expenditure and the supervision of the work are likely, at least, to be competent and effective, such as would be secured by the provisions of the Latimer-Brownlow bill now pending in Congress. Why not spend a few millions here? is the question asked by many when they hear of the immense sums absorbed by our over-sea enterprises. The question is a fair one, for we can well afford to do it. There is precedent for it, too. The government is spending millions in waterways and irrigation, but nothing is done that will directly benefit the farmers of such States as Illinois and Indiana, for instance.

VALUABLE SUGGESTIONS FOR THE BUILDING OF PERMANENT ROADS.

Among the addresses upon the technical part of the question—the materials to be employed and the building methods—the best was that given by the representative for Great Britain, Mr. A. W. Campbell, director of public works in Canada. This was most favorably received by the convention and was honored by a rising vote of thanks. Mr. Campbell in his address reviewed the various materials that could be used practically for roadmaking and conceded that the selection of the material had to be governed by local circumstances, but the point upon which he insisted most strongly was the necessity for a fully efficient drainage, which he considered to be the first and most important essential of a good road. Other speakers explained the great advantage of wheel tracks made of paving bricks. Wheel-track roads are no new experiment. A road with stone wheel tracks has been in use between Albany and Schenectady, N. Y., for sixty years, giving the greatest satisfaction. The ancient Egyptians made roads of this kind for transporting their very heavy loads, and in London, England, these roads have been long in use and have been proved to so lessen the tractive force needed that a horse weighing sixteen hundred pounds could draw thirty and a half tons. The only disadvantage of this system is the heavy cost of construction, even in districts where stone is plentiful. Such a roadway in the neighborhood of New York City costs about $14,000 per mile. Although there is practically no expenditure afterwards for repairs, the heavy outlay for building makes it prohibitive in most districts, but wheel-track roads of vitrified brick can be laid for a fraction of the cost of the stone roads, and, when laid on a good foundation, are not only fully equal, but superior in point of efficiency and durability.

THE BAD USE OF A GOOD MATERIAL.

We noted with regret that there was a sentiment, expressed chiefly in conversation, in favor of burned clay as a material for roadmaking. This burned clay, which is known in some localities by the ridiculous name of gumbo, is something with which the writer many years ago had considerable experience in roadmaking. It is probably the most unsatisfactory and deceptive of all the materials proposed and its use can only result in disappointment. The burned clay known as "gumbo" is undesirable for permanent roadmaking for the same reason that salmon brick would be worthless as a paving for our city streets. The clay, like the salmon brick, is underburned. The way it is produced is to lay it up in heaps, about six or seven feet high, with fuel mixed with it. The fuel is ignited and when it is burned out the material is ready for use. It is not even as well burned as a salmon brick. It is probable that if the clay was burned to vitrification it would give us a splendid material for roadmaking, but this cannot be done by burning it in the open air with a little fuel mixed with it. To vitrify the clay it would probably have to be burned in a kiln, in which case it is simpler and better to mold our clay and deliver it in the shape of vitrified paving bricks. Burned clay is all right for ballasting railroads and purposes of that sort, but it will be a mistake to use it to any great extent for the building of public roadways. Something better is needed for the permanent improvement of our public roads. If we are to use burned clay for that purpose, use it in the form of vitrified brick or paving block.

BRICK PAVEMENTS STAND THE TEST OF TIME.

Has it ever occurred to you, gentle reader, that a brick pavement is the only one that will survive the ten-payment plan of paying for it? The asphalt pavement as known in America certainly will not. No one now makes any claim for it as to durability. The wood pavement is essentially a short-lived pavement. It is used because it is manifestly less hard and so is less noisy than brick, and for no other reason. In Paris, where they put down wood pavements better than anywhere else in the world, where they use the most carefully selected material and lay it in the most skillful and painstaking manner, they do not expect to maintain it in good condition for more than five or six years. We have seen wood pavements renewed in that city after they have been down four years and a half, and during all of that period they were subject to careful inspection and repair. This inspection amounted to a patrol. Men with blocks, tools and material constantly traversed the pavement making repairs. This process begins almost as soon as the pavement is put down and never ends. The wood block pavement pretends to nothing else. No amount of creosoting or other doctoring can make wood pavements durable. The bitulithic pavement is but another asphalt. It is marketed by a part of the old asphalt crowd under a new name, but is a similar composition with no essential difference between it and the defunct asphalt. There are pavements in Indianapolis which were laid a few years ago according to the general principles of the bitulithic method, and before they were paid for they were in a decaying condition. They have been patched several times and to an extent resurfaced, and are already almost worn out. The bitulithic pavement involved a more elaborate method of construction than the asphalt and some changes in detail, but none of principle. When it comes to the real test, the test of time, there is no modern pavement that compares with brick. The story of Terre Haute's brick streets, so well told in the leading article of this issue, is convincing and unanswerable.

THE FOOLISHNESS OF ENACTING LAWS WHICH ARE NOT ENFORCED.

There are very few cities in the country at this time that are not looking over their building regulations. We offer the suggestion that it is entirely possible to go too far and to be too radical in matters of this kind. Generally speaking the fault of our cities in this matter is not so much in the law as in its lack of enforcement. It is very probable that cities of the class of Cleveland or Buffalo, Pittsburg and Detroit have building regulations that are much more strenuous and exacting than those of any city of great Britain, and unless we except Paris it is probably true that none of the French cities have laws more severe than those mentioned. Now, the fire loss on $100 of risk in France is six cents, in Great Britain it is nine cents, and in New York State it is sixty cents. In Germany it is about thirteen cents. The building laws of Boston or New York are much more exacting in their verbiage than similar laws for the cities of Great Britain or Germany. Nevertheless, the fire losses in the cities of the countries of Europe named are greatly less than those of New York or Boston. Hence, we must believe that a large measure of weakness with us is not so much in the law itself, but as in its non-enforcement.

INTERROGATORY.

By M. C. Meigs.

Who's going to do this world of toil
 For man and womankind?
Who'll make the bread and till the soil
 When every one's refined?

Who'll fill the hollow, cut the rise,
 And furnish railroads with supplies?
Who'll true the track and tamp the ties
 When every one's refined?

Who'll hew the stone to make the piers,
 And press the work that's in arrears?
Who'll shear the sheep and sharp the shears
 When every one's refined?

Who'll swing the cradle, swarm the bees,
 And pare potatoes, pick the peas?
Who'll pluck the prunes and prune the trees
 When every one's refined?

Who'll hitch the team and hold the plow,
 Press the cider and milk the cow?
Who'll beat the carpet for the "frau"
 When every one's refined?

Who'll hold the throttle through the night,
 While sleeping scholars take their flight
Across the plain and mountain height—
 When every one's refined?

Who'll heave the coal far out from land,
 And keep the ironclads in hand,
While dauntless Deweys give command,
 When every one's refined?

Who'll fell the forest, trim the trees,
 And slick the pavement on his knees?
Who'll do the drudgery, if you please,
 When every one's refined?

NOW THIS WILL JAR POOR EVE.

No Serpent, But Mr. Stinson Swears Apple Diet Will Make Us Angels.

Would you be very, very good—
 Eat an apple!
You might be an angel if you could
 Eat a million apples!
Do you feel inclined to smoke?—
Now this isn't any joke—
 Don't; just eat an apple.

If you feel inclined to swear,
 Eat an apple!
Don't shake your fists and tear your hair—
 Eat an apple!
If you want to drink or chew,
Or anything you ought not do,
 Eat an apple!

In fact, would you be highly moral,
Never sin and never quarrel,
 Just live on apples.

John T. Stinson, director of pomology at the St. Louis Exposition, will give you any further information. He says that an apple diet will cure low morals of every kind and on Apple Day, September 27, he's going to start in to reform humanity by giving away 1,000,000 apples to exposition visitors.—*Chicago American.*

The Scott Manufacturing Co., Keokuk, Iowa, is installing a Scott noiseless plant for the Milton Press Brick Co., at Milton, Iowa.

Ott Bros., Olathe, Kan., write that they will start a brick plant at that place and will be pleased to receive catalogues of brick machinery and supplies.

Any of our readers looking for a bargain in a brick plant will do well to correspond with James & Abbot, 165 Milk street, Boston, Mass., whose ad. appears on Page 643 of this issue.

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I GET MORE valuable experience in my engineering practice than it is possible for a man to get in manufacturing, though if I hadn't been a brickmarker for 15 years I wouldn't be so well fitted for the work I am doing.

WILLARD D. RICHARDSON,
Brickworks Engineer.

See page 650 and 655.

WANTED, FOR SALE, ETC.

FOR SALE—No. 6 Brewer Brick and Tile Machine, in first-class condition. Address
KIBURZ BROS.,
Monticello, Ill.
5 1 c

FOR SALE—One second-hand Hercules Brick Machine, Hercules Double Roll Crusher and a quantity of wooden brick pallets, in good condition, 10x34 and 10x32. Red Star Brick Co.,
Warren, Pa.
5 1 d

WANTED.

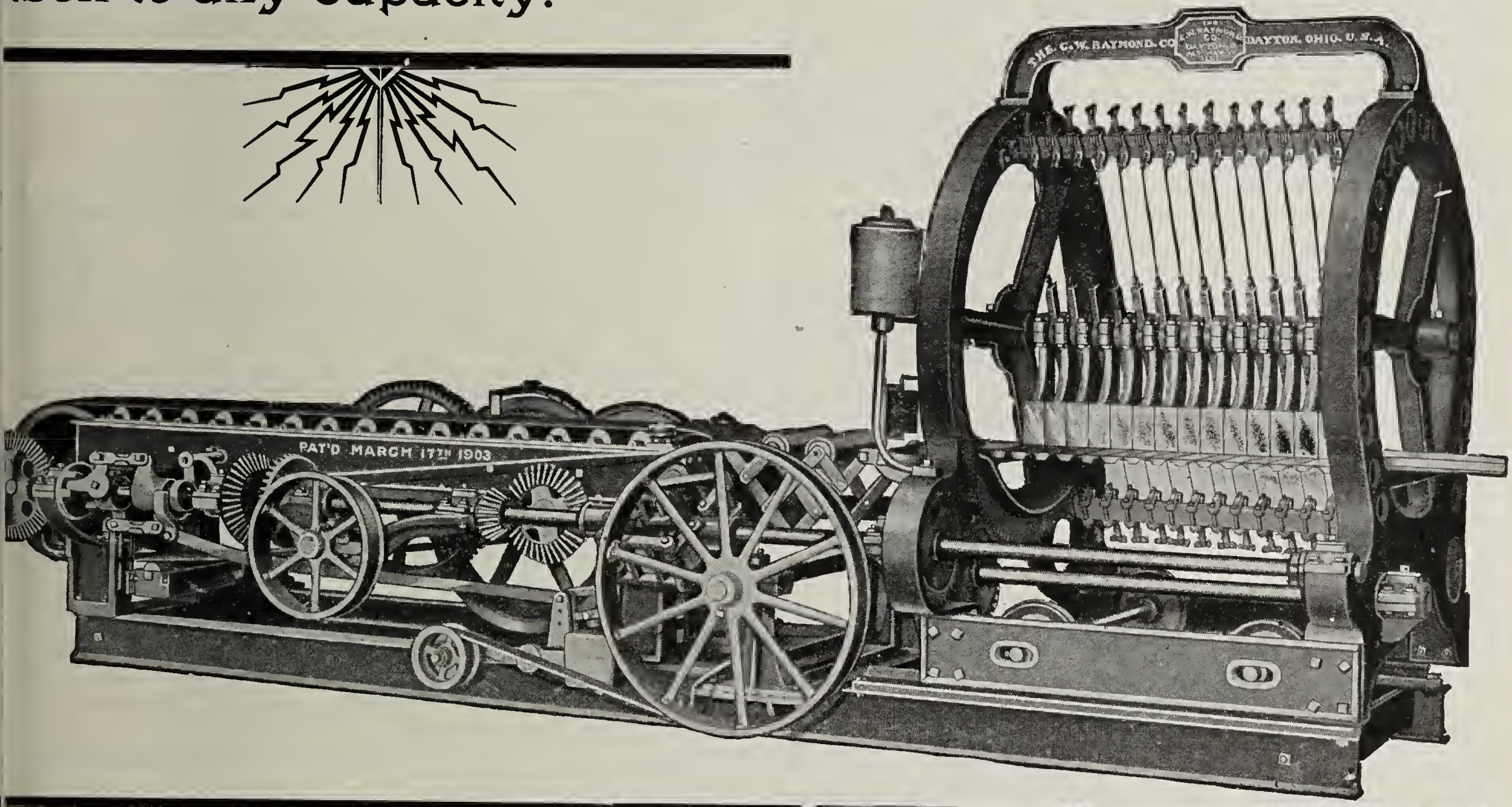
Two experienced burners for fire-proof and glazed material. Good wages to steady men. Address B. B. HOLLAND, Supt.,
Ottawa, Ill.
5 2 c

FOR SALE—90 h. p. engine and 70 h. p. boiler, A1 condition. Cheap. Located in West Virginia. Address
TYGARTS VALLEY BRICK CO.,
No. 8 Prince Karl Apartment,
Washington, D. C.
5 1 cm

For Sale, Wanted, Etc., Ads Continued on Pages 645, 646 and 647.

YOU CAN MAKE GOOD BRICK

ust as cheaply as poor ones, and get more for them. Isn't it business proposition, therefore, to equip your plant with nachinery that will make the Good Ones? It costs o more and the results are tenfold better. This Cutter has down shear cut. Cuts true to line and leaves no feather dges. It has a continuous rotary motion and regulates tself to any Capacity.


THE C. W. RAYMOND CO. DAYTON, OHIO. U.S.A.
PAT'D MARCH 17TH 1903

he RAYMOND AUTOMATIC CUTTING TABLE

HE C. W. RAYMOND CO., DAYTON, OHIO, U.S.A.

BOSTON, MASS., July 24, 1903.

THE C. W. RAYMOND CO., Dayton, Ohio.

Gentlemen :—We are pleased to state that the Automatic Side Cutting Machine which you installed at our plant at Dover Point is a success. We are no doubt making brick of a clay which is difficult to manipulate. It will not bear great pressure without distortion.

The first cutter we used was driven by the clay bar itself, and swelled the bar very badly out of size and shape so that the bricks were delivered with great variation as to length and height. With your cutter, however, which is driven positively from the Brick Machine itself, the speed being regulated by the governor to correspond with the travel of the clay bar, all of these difficulties have disappeared and we are getting a perfectly square and even size brick, cut true to line, and we can moreover use the clay in a very soft condition.

Altogether, we can heartily recommend your cutter to any one desiring to make a first-class wire-cut face brick.

Very truly yours, THE FISKE BRICK CO.

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING NEWS.

THERE HAS BEEN a great deal of delay in getting building operations under way during the past month, on account of the continued bad and rainy weather, but still there has been a demand for brick which kept all the local plants and a good many of the near-by plants busy, and still the demand was not supplied. This comes from the fact that so much brick is going into small jobs, in building cottages, flats, etc., where the contractors jump in between times and put up a lot of brick, even if the weather has been bad. Visitors to the city cannot help remarking about the immense amount of residence building, as the streets have building material piled at the sides in almost every direction you take a drive. The fact of the matter is, this city has more nearly kept up with the demand for business houses, office buildings and manufacturing plants than for residences, and the investors are now finding such a demand for houses that they are bending every effort to supply it.

During the past three weeks there has been a great deal of delay on account of inability to get brick from a good many of the plants in the gas belt. This made the demand a good deal heavier on the plants of this city and close-by points, where the high waters did not hinder them, but their capacity was not nearly great enough to meet requirements.

A good many of the Kansas brick plants were built on low ground, and the rivers flooded the premises, while those on higher ground were unable to work regularly on account of the mud. The railroads also suffered greatly by loss of bridges, etc., and hence were not able to properly take care of the output of such plants as were getting out the regulation amount of brick.

City Engineer Pike informed the Board of Public Works at a recent meeting that the public work now under contract amounts to about $1,000,000, and this amount will be greatly added to, as the City Council continues its work, for there are ordinances now pending for miles of paving, curbing, guttering, sidewalks, etc.

During the month of April the number of building permits issued from the office of the Superintendent of Buildings was 405, amounting to $814,050, which shows a falling off, for the same month last year showed 464 permits, amounting to $887,410. This difference is supposed to be caused by the great amount of bad weather in the month, and from the talk of contractors it is evident the summer months will show up a very large amount of construction business, for conditions are good, there are no labor troubles, except with the ironworkers, and their strike is now having very little effect upon building, as plenty of non-union men seem to be found. Many say their worst trouble this year will be to find plenty of material to keep them busy, and it is up to the brick manufacturers to see that their part of the material keeps coming.

The Midland Sand-Lime Brick Company has but recently been incorporated in this city, with a capital stock of $80,000.

Robert Nesch, President of the Pittsburg Brick Company, has just returned from a trip through Kansas, coming back by way of Pittsburg, where he watched the operation of the new steam shovel in the shale bank, and was much pleased with its working. His main object in making this Kansas trip, however, was to close up a deal whereby he will be one of a company to open up a big cement plant in Neodesha. Mr. Nesch has been working on this proposition for the past six months, but was unable to get quite enough capital interested, until he but recently came in touch with Mr. Cruikshank, a thorough cement man of Ohio. When these two men got together, however, it did not take long to close a deal whereby they are to put up a 1,500-barrel-per-day cement plant by Little Bear Mount, near Neodesha, to cost about $800,000. They have incorporated as the American Portland Cement Company, with a capital stock of $1,500,000, the papers to be filed in New Jersey. According to the contract, the plant is to be completed by a year from next December, but they expect to have everything in running order a good deal earlier than that date.

The Stuckenburg Pressed Brick Company has shut down its plant in this city for a period of about six weeks to make repairs and better the condition of the machinery.

Brick prices are holding firm just now, with indications that there may be a slight stiffening, but the Kansas gas-belt brick will prevent a very great stiffening in prices in this market. Quotations are: Common salmon, $6 per M; red and hard, $7; select reds, 2-14 inches thick, $11; vitrified, $13; first quality red pressed brick, $16; second quality, $13; semi-vitrified, $18; chocolate, $20; granite, $20; buff, $23; grey, $24.

The Pittsburg Brick Company has just closed a contract with J. C. Mardis, Vice-President of the Capital City Brick and Pipe Company of Des Moines, for a large part of the brick which are to be used in the construction of the new university buildings in Lincoln, Neb.

The E. J. Gump Brick Company is reporting a splendid demand for its output and only wishes the plant was able to make a larger output.

The Kansas City Brick and Tile Company reports that it has a number of contracts for paving here which it is unable to do anything with just now, on account of the fact that the plant has been flooded. The damage to the plant was little, the pits having been flooded, but a couple of railroad bridges on the switch to the plant have been washed out, so they are unable to make shipments, and as a result they have a number of cars of brick dumped on several different streets, but not enough to complete any of them.

J. W. Smith, of Wellington, Kas., and E. P. Elliot, of Chanute, are looking for a location to put in a brick plant and will probably locate near Wellington.

Parties from Texas have secured a location at Henryetta, I. T., and expect to put in a $50,000 brick plant and make use of the gas which was but recently struck. Work on the plant is expected to begin within a short time.

The J. M. Harry Brick Company has been incorporated in Dallas, Tex., with a capital stock of $80,000, by Mrs. F. E. Harry, R. D. Harry and J. M. Harry.

A contract has been awarded to pave five blocks of Austin avenue, in Waco, Tex., with vitrified brick. The contract was landed by Ockander Bros., of Texarkana, Tex.

Dr. W. S. Baldwin, of Paris, Tex., who represents the H. Huenneke system of manufacturing sand and lime brick, has been looking over Houston, Tex., and expects to put one of their plants in there, to use the sand from the San Jacinto River, with a daily capacity of 20,000.

A brick plant is shortly to be established in Tower City, N. D.

The Deadwood Brick Manufacturing Company of Deadwood, S. D., has sustained a fire loss of $10,000, partly covered by insurance.

C. W. Carman has sold out his brick manufacturing plant in Hamburg, Ia., to F. Johnson.

The Benton Brick Company, of Benton, Ark., is advertising its plant for sale.

The Composite Brick Company has been incorporated in Omaha, Neb., with capital stock of $1,000,000.

The Milton Pressed Brick Company has been organized to construct a plant in Milton, Ia.

John B. Wartchow has succeeded to the brick and tile business of McClure & Evan, in Lohrville, Ia. K. A. W.

TREAS. SIBLEY OUT OF THE PAVING BRICK BUSINESS.

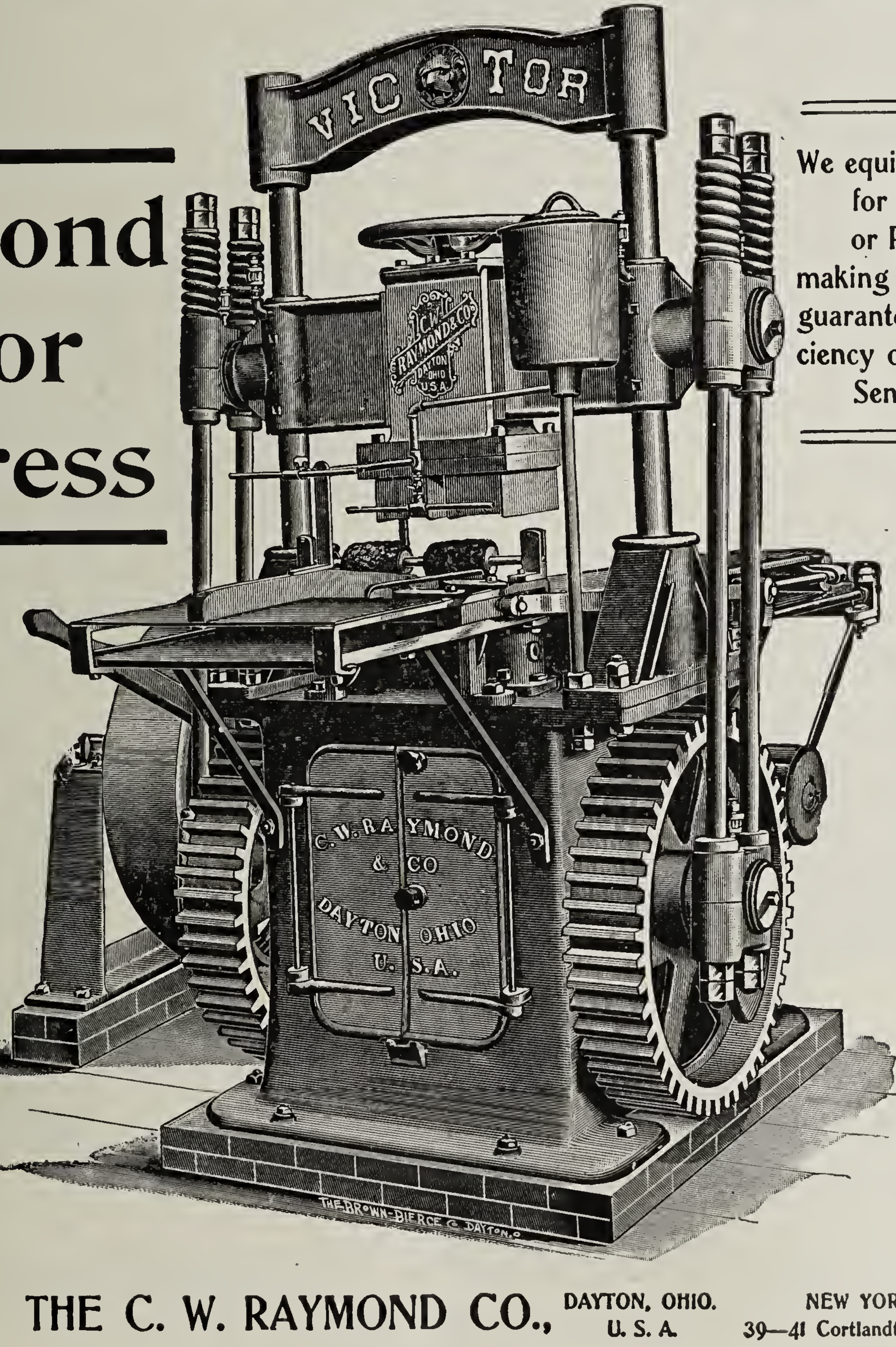
John W. Sibley, for the past few years general manager of the Southern Clay Manufacturing Company, Chattanooga, Tenn., and Birmingham, Ala., advises us that he has sold his stock, resigned as manager and is at present devoting his attention to the mining and shipping of high-grade shales and fire clays, as well as to the coal mining business, in which he is engaged with his brother, W. L. Sibley. However, he will not stay out of the brick manufacturing business very long, for he has in view the erection of a large plant for the manufacture of press and common brick.

We introduce a new aspirant for trade favors with this issue of The Clay-Worker, Messrs. Barchard & Co., Ltd., Toronto, Ont., Canada, whose ad. will be found on Page 646. While this firm has been established for nearly half a century, they have only taken up the manufacture of wood pallets within the past few years, during which time they have supplied some of the largest brickyards in Canada and have decided to "reach out" for trade in the United States. They have recently received an order from one concern for 100,000 pine pallets. They guarantee prompt delivery and say their prices "are right."

THE VICTOR RE-PRESS

Do You Re=press your Brick? Do you give them the smooth surfaces, the square corners, and keen edges necessary to make a high=class brick? Do you recognize the worth as an advertisement, of your distinguishing imprint upon each brick? All these advantages can only be had by re=pressing. Re=pressing enhances not only the beauty of the brick, but their utility and sale value. The Victor has attained an unequaled distinction and had a phenomenal sale for this class of work. Its advantages and conveniences are so manifold, as to place it in a class by itself. The first machine that meets your eye on a well=equipped brick plant, is a VICTOR RE=PRESS. IT IS A MONEY MAKER AND A MONEY SAVER

Raymond Victor Re=Press


VIC TOR
C.W. RAYMOND & CO. DAYTON OHIO U.S.A.
C. W. RAYMOND & CO DAYTON OHIO U. S. A.
THE BROWN-BIERCE C. DAYTON. O

We equip plants complete
for Building, Fire
or Paving Brick
making the most liberal
guarantees as to the efficiency of our machinery.
Send for Catalog

THE C. W. RAYMOND CO., DAYTON, OHIO. U. S. A.

NEW YORK OFFICE
39—41 Cortlandt Street, Room 40

Written for The Clay-Worker.

NORTHERN OHIO BRICK AND BUILDING NEWS.

THE BRICK SITUATION has taken on little improvement since a month ago. Up to a couple of weeks ago the weather has been very bad for building, and now since the season has opened up the anticipated boom in building has not put in appearance. This is bound to be a backward season for the brickmen of Toledo, as the buildings now in process of construction call for small quantities of brick. Beyond the use of bricks in foundations and chimneys, about 75 per cent. of buildings under construction and those to be constructed will bring very little income to Toledo brickmen. Some are inclined to think there will be a little splurge of activity for the next few weeks, then there will be a sudden drop to dullness of trade until fall, when another little spell will be in evidence. All the brickmen speak very discouragingly of the future and only live in hopes that the season may prove contrary to their expectations. While all the brickyards are running, there is enough stock to supply the trade for the next couple of months or more.

Louis P. Madson, of the Findlay Hydraulic Press Brick Company, said recently: "Our plant is running full time and capacity. We have all we can do for the next two months. Business in the city is only fair, while outside the city trade is good."

The Collingwood Brick Company set its plant in operation the last of last month. The company reports about 3,000,000 bricks on hand.

Richard W. Clarke, of Spear & Clarke, stated to the correspondent for The Clay-Worker that their plant was started the first of the month; that "trade in the city is rather quiet, but outside of the city the demand for brick is good."

Frank Gorman, president of the Kohler Brick Company, reports business good both in the city as well as outside. The company has just started its plant, with only about a half million bricks left over from last season's run.

Adam R Kuhlmann, president and manager of the Ohio Brick Company, reports business in the city as quiet, while trade outside of the city is brisk.

Lawrence Burkhardt set his plant in operation about two weeks ago and reports stock on hand from last season at 400,000 bricks.

Irving E. Macomber, of A. E. Macomber & Co., stated that their plant would be in full operation by the middle of the month. The company has about 800,000 bricks from last season on hand. Mr. Macomber is of the opinion that business will be good for the next month or two, then there will be a drop, with a good revival of trade in the fall.

Frank E. Tracy informed your correspondent that his plant has just been set in operation, with about 200,000 bricks from last season's run on hand.

The Northern Brick Company has purchased the old Shuey plant at Auburndale and has moved the plant to the new site on the East Side, where a plant will be in operation by the middle of the month which will have a capacity for 40,000 bricks daily. Racks are now being set up which will accommodate 300,000 bricks.

The brick plant of H. C. Ellis has also been set in operation.

The Perrysburg Tile and Brick Company, recently incorporated under the laws of Ohio with a capital stock of $10,000, has completed its organization with George Munger as president, Charles Hoffman as secretary and treasurer, John Wilson as manager, Dr. Henry Roether, Adolph Roether and A. C. Witzler, with the officers, as directors. Property has been purchased south of Perrysburg, O., comprising about fifteen acres of good clay soil. The clay has been tested by the American Clayworking Machinery Company of Bucyrus, the tests showing a fine quality of clay from that section. The company will manufacture tile and brick, and it is quite probable that within a year the new concern will put in a dryer to enable the operation of the plant the entire year around. Machinery for the new plant has been purchased and the construction work will begin at once.

Henry Simon, of Toledo, has just about completed the erection of his new brick and tile plant north of the city and will be manufacturing brick and tile by the middle of the month.

The workhouse brick plant was started the first of May, sixty-five hands being set to work in the yards. The idea of a sand-lime brick plant for the Toledo workhouse has been abandoned by the Board of Public Service, after having made a careful investigation. It was decided that the process for making this class of bricks had not as yet reached a state of perfection which would warrant an investment by the city. The workhouse turned out 1,800,000 bricks last year, and Superintendent Ritter is inclined to think that the record will be broken this year.

The 1st of May, which was expected to see a development of some labor troubles, passed in Toledo without any serious outbreak to speak of. The tinners threatened to strike, but the strike failed to develop, as nearly half of the union men were working and most of the employers had previously signed the new scale. In fact, only thirty-four men went on a strike. This is about one-third of what was expected to strike.

One hundred and eighty-six permits were taken out in the Toledo building inspector's office during the month of April. This is considerably more than was taken out during the previous month. Of this total number of permits granted fully 85 per cent. were for dwelling houses. During the past couple of weeks operations have commenced on a larger scale and permits have been taken out on a number of buildings of a business character.

Toledo, Ohio. T. O. D.

IMPROVEMENTS AT SHAWMUT.

A number of improvements are being made at the paving brick plant of the Shawmut Mining Company, Shawmut, Pa., under the able management of the general manager, Mr. Alfred Yates. Eleven of the kilns are being remodeled to the Yates patent, and they will in addition to this build four new kilns. Some additional machinery is being installed, including a pug mill from the shops of the American Clay-Working Machinery Company, at Bucyrus, Ohio. These additions will give the company an output of about 1,000,000 brick per month. They have a very fine shale bank some thirty feet thick, with three seams of coal in the same hill, as well as a fine deposit of fire clay. They are able to mine both their shale and coal at a very low cost. Mr. Yates says that he considers the prospects very bright for the future of this company.

If you are looking for cheap machinery, scan The Clay-Worker's "For Sale" ads.

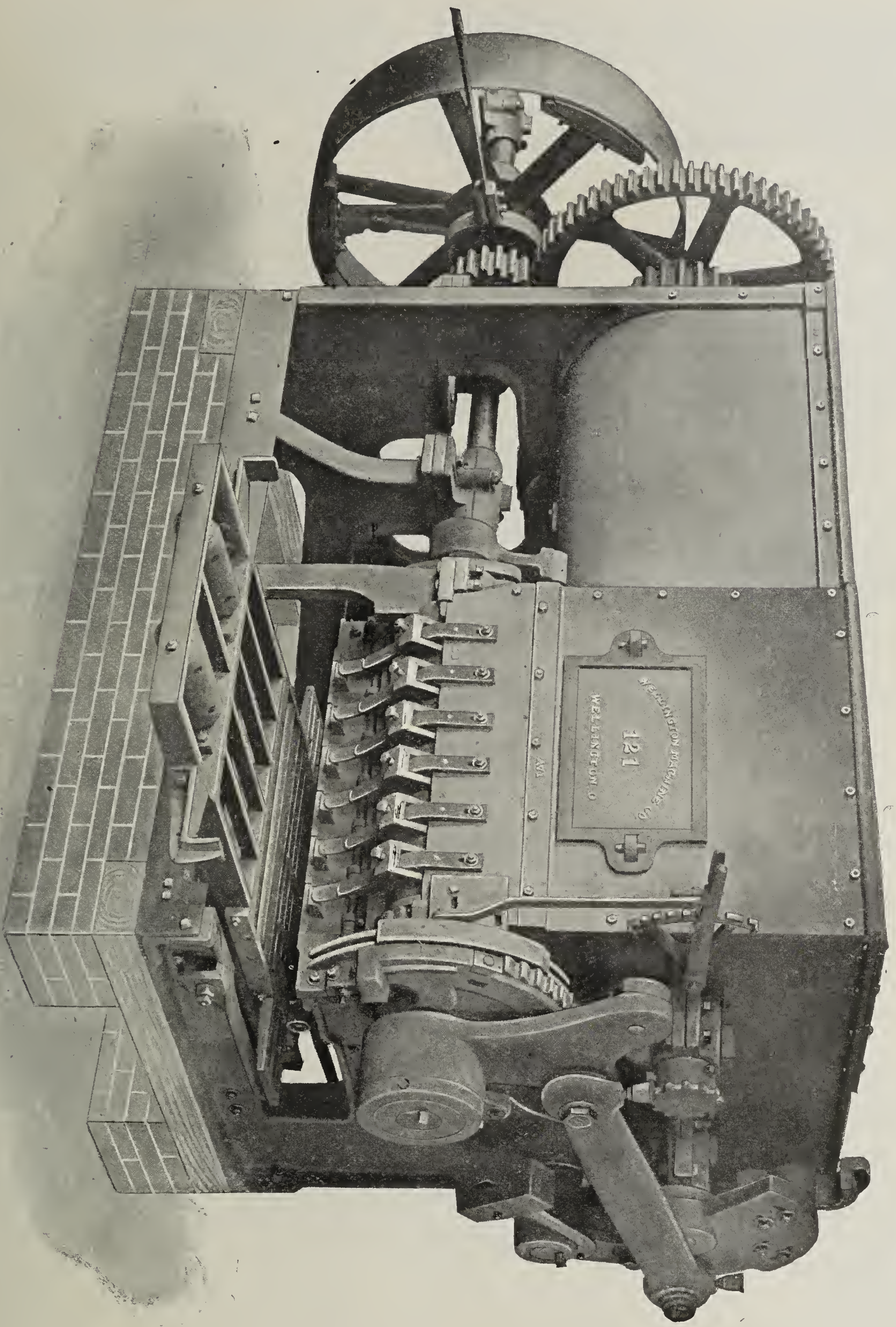
SOFT! 'T IS SPRING!

Trill, jocund birds, your song of Spring,
Let naught your gladness balk;
Who has a better right to sing?
You do not have to walk! —Puck.

OVER
175
"Monarch"
Brick
Machines
in use.

OVER
500
"Quaker"
Machines
in use.

WRITE
to us
regarding
Disintegrators,
Pug Mills,
Mould
Sanders,
and Dryers,
mooth-roll
Crushers,
Moulds,
Barrows,
Trucks,
Winding
Drums,
ump Carts,
Elevators,
ump Tables
and all
kinds of
Kiln
Castings.

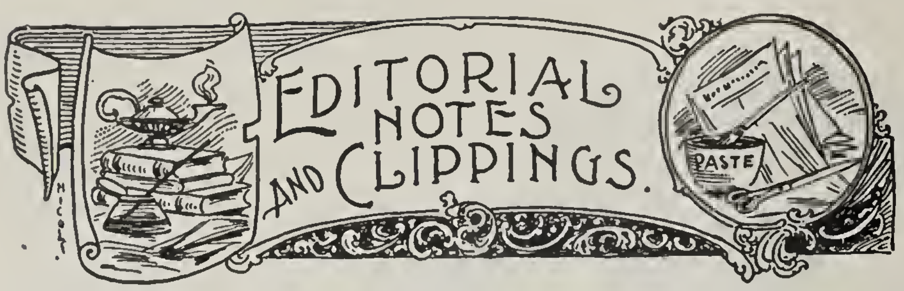


The "Big No. 6" "Monarch" Brick Machine.

REMEMBER:
You are losing money wheeling brick unless you have our
ROLLER-BEARING BARROWS.

The Wellington Machine Co.,
WELLINGTON,
OHIO.

Send for Catalogue.



EDITORIAL NOTES AND CLIPPINGS.

A. F. McDermott will establish a brickyard at Oak Park, Minn.

The Mt. Gretna (Pa.) Brick Company has been incorporated with $35,000.

D. D. Fennell writes that he is organizing a brick company at Akron, Ohio.

J. N. Snider has purchased the brickyard of A. L. Capps, at Hopedale, Ill.

C. U. Smith contemplates operating a brick plant at Burnhamville, Minn.

Thomas Neiswanger, Washington, Iowa, has purchased a brick plant at Harvey, Iowa.

The Wellston (Ohio) Brick and Tile Company has been incorporated with $10,000 capital stock.

The Millville (N. J.) Brick Manufacturing Company has been incorporated with $100,000 capital stock.

The A. W. Miles Brick Company will double the capacity of their plant at Livingston, Mont., this summer.

Articles of incorporation have been filed by the Kalamazoo (Mich.) Pressed Brick Company. They have $40,000 capital.

Mr. Charles Hoshour, of Oklahoma City, Okla., contemplates the establishment of a plant for the manufacture of sand-lime brick.

The Lafferty & Willen brick plant at Clay City, Ind., was damaged to the extent of $1,000 by fire May 3. This is the second fire they have had in a year.

F. G. Banker has made a number of improvements in his brickyard at Greenfield, Ind., and his yard, while small, is a model one in many respects.

The W. S. Budd Brick Company have made a number of improvements in their plant at Dutchess Junction, N. Y., putting in three new brick machines.

Carl Laspey, a well-known brick manufacturer of Miamisburg, Ohio, died at his home there recently. He leaves a wife, three sons and one daughter.

The Concord Brick and Building Company has been incorporated at Concord, N. C. The incorporators are R. O. S. Miller, Ernest Query and E. P. Deal.

Dr. W. L. Ewen, of Alloway, Salem County, New Jersey, has leased the brickyard of Smith B. Sickler at Pentonville, N. J., and has commenced operations.

The Lansdowne Brick Company of Baltimore, Md., has been incorporated by Wm. Whitridge, G. R. Morrison, E. L. Ward and others, with $50,000 capital stock.

C. Baker and Wm. Burchett have purchased a site at Olympia, Wash., on which they will at once erect a brick plant for the manufacture of building and fire brick.

Hilend Rose, one of the pioneer brick manufacturers of the Hudson River section, died suddenly at his home in East Poughkeepsie, N. Y. He leaves seven children.

The J. M. Harry Brick Company has been chartered at Dallas, Texas, with $80,000 capital stock. The incorporators are Mrs. F. E. Harry, R. D. Harry and J. M. Harry.

Milward Bros., Dayton, Wyo., write that they have a fine deposit of fire clay and would like to interest parties with some capital for the purpose of developing same.

The Clearfield Clayworking Company, Clearfield, Pa., recently installed a Victor repress; their order was placed through the Pittsburg office of the C. W. Raymond Co.

The Cloverport (Ky.) Brick and Tile Company has filed articles of incorporation. G. S. Bridges and J. D. Baskin of Louisville, Ky., and R. N. Hudson, Cloverport, are interested.

The Daleville (Ind.) Sand, Lime and Brick Company has been incorporated with a capital stock of $50,000. The principal business office will be located in Muncie. The company will manufacture brick and like products. The directors are: H. C. Schlegal, J. W. Overman, P. F. Lefter, C. O. Dale, J. M. Pricett, J. C. Schlegal, Alex Touchman, E. W. Tucker, Frank Daniels, J. P. Kandel and James M. Motsenbocker.

George J. Crotzer, one of the superintendents of the American Encaustic Tile Company, Zanesville, Ohio, died quite suddenly April 25.

The T. B. Townsend Brick and Contracting Company, Zanesville, Ohio, has just booked an order for 1,000,000 paving brick to be used in the town of Westerville.

The Kentucky Vitrified Brick Company's plant at Louisville, Ky., was almost totally destroyed by fire April 27, entailing a loss of $50,000. They carried a small insurance. The plant will be rebuilt.

Boughten Bros., of Butte, Mont., have established a small hand yard at Livingston, Mont. They expect in a short time to install brick machinery and necessary appliances for a modern machine plant.

The Perrysburg (Ohio) Tile and Brick Company has been incorporated by George Winger, A. H. Wilson, C. A. Hoffman, H. R. Roether, A. J. Witzler and A. G. Roether. They have $10,000 capital stock.

The Pope Clay Product Company, of Aiken, S. C., has been chartered. This is a big clay concern which will do business on a capital of $700,000. Albert A. Pope is president and General Nelson A. Miles is vice-president.

The Poston Brick Company of Eldorado, Pa., is about to of their paving brick plant at Crawfordsville, Ind., having added eight new kilns and enlarged their dryer, and still can hardly meet the demand for their pavers.

The Eldorado Brick Company of Eldorado, Pa., is about to install a complete stiff mud outfit, purchased from the C. W. Raymond Co., through their Pittsburg office, a combination brick machine and repress, all of which will be in operation in a very short time.

A corporation has been formed at Palouse, Wash., to be known as the Palouse Brick and Tile Company. George W. Peadycord is president and Joseph Terteling manager. A twelve-acre tract of land has been purchased, on which a modern plant will be erected.

P. Pelligrini, of Atlanta, Ga., has purchased an interest in the Morrison-Trammell Brick Company and will move to Rome, Ga. Mr. Pelligrini, who is a clayworker of wide experience, will have charge of the East Rome plant, and all kinds of brick and terra cotta will be manufactured.

M. F. Trabert has sold a half interest in his brickyard at Prescott, Iowa, to Mr. Croft, of Omaha. Mr. Croft has lately been of the firm of Corneer Bros. & Croft, of Omaha, Neb. He is a man well versed in the business, having been in the business for twenty-five years in Omaha alone.

The Adrian Manufacturing Company is the name of a new corporation at Adrian, Mich. They have purchased the works of the old Adrian Brick and Tile Machine Company and will continue in the brick and tile machine and foundry business. Frank Schoonmaker is manager of the new concern.

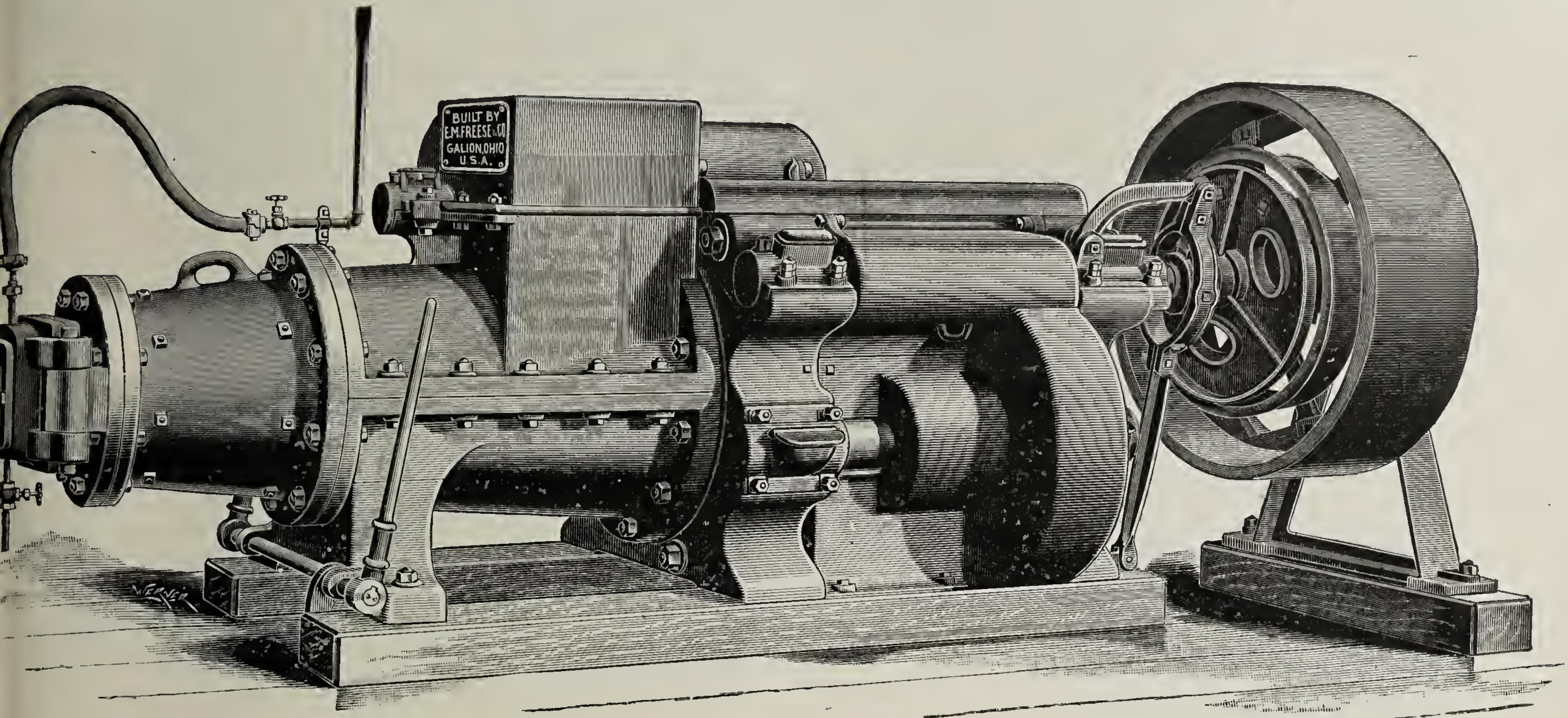
P. B. Broughton & Co. of Bradford, Pa., are making large shipments to Baltimore and Rochester, having shipped already over 400,000 face brick and have orders from both cities booked, amounting close to a million more and the prospects are that they will be kept busy practically all season furnishing these two cities.

The South Bend (Ind.) Brick Company has purchased thirty-three acres of fine clay land on which they are erecting an immense brick plant, which will be up to date in every particular. They are also making a number of improvements in their old plant, and when completed the two plants will give them a capacity of 100,000 brick per day.

William L. Brecht, president of the Flint Brick Company, Des Moines, Iowa, one of the largest brick concerns in the West, died at his home in that city April 18. His death was due to heart failure, and though Mr. Brecht had been seriously ill with rheumatism and the grip for some time past, he was not considered as dangerously sick. Mr. Brecht was fifty-two years old and one of the best-known business men of Des Moines, having been actively engaged in business there since 1880. Mr. Brecht first became interested in brick manufacture in 1888, when he was appointed superintendent of the Des Moines Brick Manufacturing Company, at that time the largest plant in the world. Since then the company has passed out of existence. In 1893 he left the Des Moines company and in company with H. B. Hedge organized the Flint Brick Company. From a comparatively small concern the plant has grown to be one of the largest in the entire

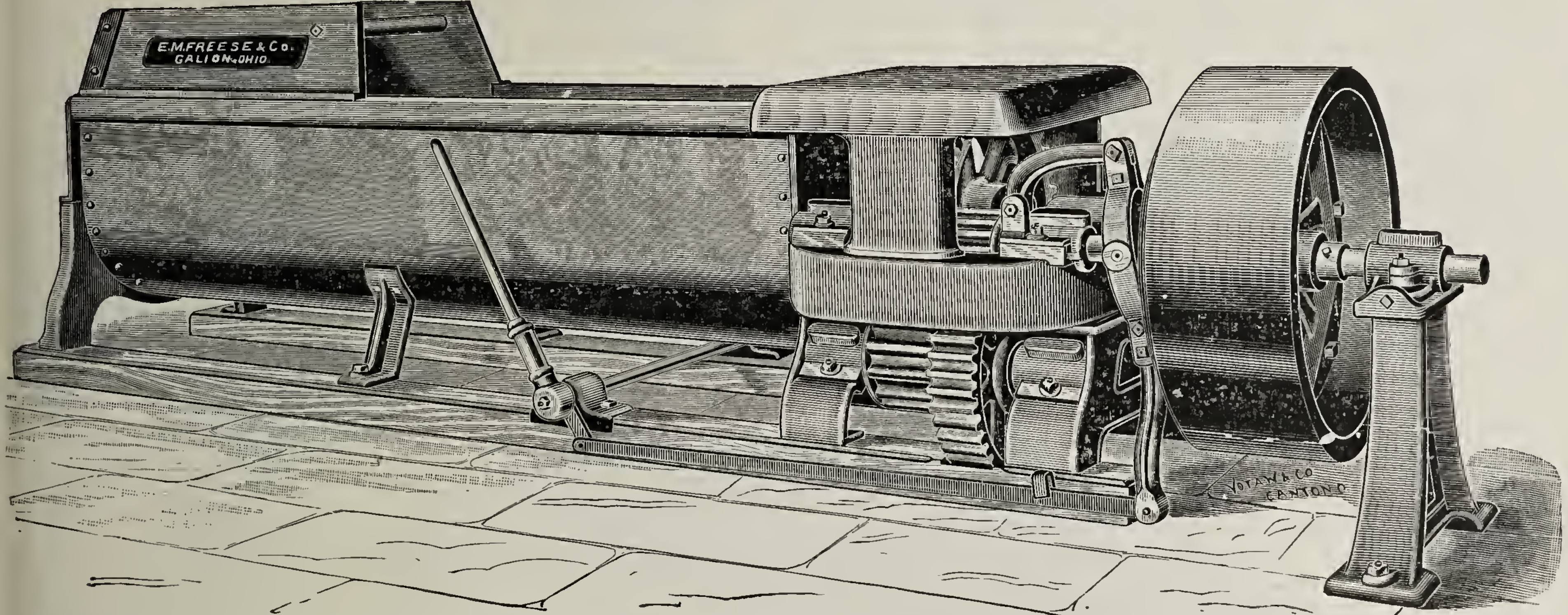
[CONTINUED ON PAGE 640.]

Our Mammoth Brick Machine


BUILT BY
E.M.FREESE & CO.
GALION, OHIO
U.S.A.

THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

Our Pug-Mills Have Features of Great Merit.


E.M.FREESE & Co.
GALION, OHIO.
VOTAW & CO
CANTON O

THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 682 and 683.

EDITORIAL NOTES AND CLIPPINGS—Continued.

West and one of the best known. Mr. Brecht owned a controlling interest in the plant. A widow and five children survive him.

The Fultonham Brick Co., Axline, O., recently placed an order for fans with the Pittsburg office of the American Blower Co., Detroit.

The Morrison-Trammell Brick Company, Rome, Ga., are in the market for a good second-hand dry or wet pan of medium or small size.

A brick kiln which was being erected at the plant of the Allegheny Brick Work, Tarentum, Pa., collapsed recently without any warning and three men were seriously injured.

The pressed brick plant at Deadwood, Colo., owned by Thomas Whittaker, was totally destroyed by fire April 29. The loss is estimated at $20,000. The plant will in all probability be rebuilt.

The Midway Brick Company has been granted a charter to manufacture brick at Burlington, N. C., with $15,000 capital. The stockholders are J. A. Bryan, L. B. Williamson and Solomon Homewood.

Hull & Lewis, Williamsburg, Iowa, in renewing their subscription to The Clay-Worker, say that they have started their plant for the season, which bids fair to be a good one. They cleaned up their stock completely last season and are now running full handed to supply the early demand.

S. B. Mills, a contractor, 133 Longmarket street, Cape Town, S. Africa, writes that he contemplates establishing a paving brick plant at Cape Town and will be thankful for information in regard to equipment of same, including machinery, dryers, kilns, etc. He will erect a plant of 15,000 daily capacity.

The Winget Concrete Machine Company of Columbus, Ohio, are erecting a building of their concrete blocks at the St. Louis World's Fair. It is located just east of the Press Building and Wireless Telegraph Steel Tower, and north of the Liberal Arts Building. The public are invited to inspect the building. One of the machines will be shown in operation.

Bradford (Pa.) Terra Cotta Company has commenced work and has turned out several kilns of excellent terra cotta, but owing to the brick mason's strike have been unable to get their buildings completed. They have received a consignment of machinery from the Raymond Company, which is being placed and will be in operation in a short time.

The Tuna Valley Brick Company, Bradford, Pa., has been shut down several weeks owing to the strike among the brick masons at Bradford and have been unable to get their new kilns finished. This is a new company in the Bradford district and which has met with the greatest success in getting their excellent product into the Pittsburg markets.

The W. P. Kelly Brick Company at Windber, Pa., recently held their annual meeting and elected officers as follows: President, W. P. Kelly; vice-president, George W. Gallagher; secretary and treasurer, J. D. Patton. They have recently purchased an acre of land adjoining the plant for the purpose of enlarging their present plant. They have also lately acquired possession of the old Blairsville (Pa.) plant, which they will rebuild and put in operation in a very short time.

At a recent meeting of the stockholders of the Bruce H. Campbell Brick Company, Johnstown, Pa., the following directors were elected for the ensuing year: Judge F. J. O'Connor, Curt G. Campbell, Harry Swank, Frank W. Otto, S. C. Ream, John B. Lowman and Bruce H. Campbell. It was decided to enlarge the plant of the company at Sheridan Station, Pa., and after the improvements the output will be added to by the manufacture of paving block, hollow building tile, etc.

The American Blower Company, Detroit, Mich., advise us that they are furnishing apparatus for waste heat dryers for the following firms: C. F. Thomas & Sons Brick Co., Buckeystown, Md.; Michigan Vitrified Brick Company, Bay City, Mich.; Bessemer Limestone Company, Youngstown, Ohio; Acme Brick Company, Marietta, Ohio; Laural Clay Product Company, Contec, Md.; Hanover Brick Company, Whippany, N. J., and induced draft apparatus for the Onondaga Vitrified Brick Company, Warners, N. Y.

B. E. Ladow & Co., dealers in clayworking machinery and supplies, is sending out notices of removal from Chicago, Ill., to Dwight Building, Kansas City, Mo., which will bring them nearer to the center of the territory they control. They say they will continue to handle the same line of clayworking machinery they have in the past, which consists of the Wellington (Ohio) Machine Company's line of soft mud clayworking machines, the "Quakers" and "Monarchs;" and the J. D. Fate Co., of Plymouth, Ohio, who manufacture the well known line of stiff mud machines, the "Hummers" and "Premiers" for both brick and tile; together with the complete line of yard supplies and auxiliary machines put out by each company.

George E. Howard, proprietor of the Butler (Pa.) Brick Factory, was seriously injured by running into a red-hot poker, which penetrated his right eye. It is feared he will lose his sight.

The American Blower Co. of Detroit, has recently shipped apparatus for steam dryers to the Conklin-Armstrong Terra Cotta Co., Philadelphia, and the Montello Brick Co., Perkiomen, Pa.

The Carbon Brick Company of Pittsburg, Pa., has about completed the overhauling of their works and are turning out a good common brick at the rate of 30,000 every day. Their new Pittsburg dryer is doing good work.

A new brick company, known as Garland & Wood Brick Company, has commenced operations at Edgewood near Knoxville, Tenn. Gardner Wood is manager of the concern. They will have a capacity of 20,000 brick per day.

The firm of Garrison & White, Bloomington, Ind., has dissolved partnership and the business will hereafter be conducted under the name of the Garrison Brick Company. J. H. Garrison, the founder of the business, after fifty-five years of active life as a brickmaker, has retired and C. P. Garrison, his son, will assume his interest.

Work has been commenced on the new plant of the Great Eastern Pressed Brick Company at Mertz, Ind., and will be rushed through to completion as rapidly as possible. L. A. Goodman, Baltimore, Md., is manager of the company and is on the ground to superintend the construction of the plant. A greater part of the product of the concern will be shipped to Baltimore, where it will be used in the work of building the "New Baltimore." The pressed and ornamental bricks will be special products of the company and will be largely used in Baltimore.

L.V.

SOMETHING NEW FOR INDUSTRIES.

THE LEHIGH VALLEY RAILROAD CO.

is about to open a new territory in the New Jersey Clay Belt. Very desirable locations are offered to manufacturers of Clay and Kaolin products. For further information address P. H. BURNETT,
Industrial Agent,
143 Liberty St., New York.

SAWS

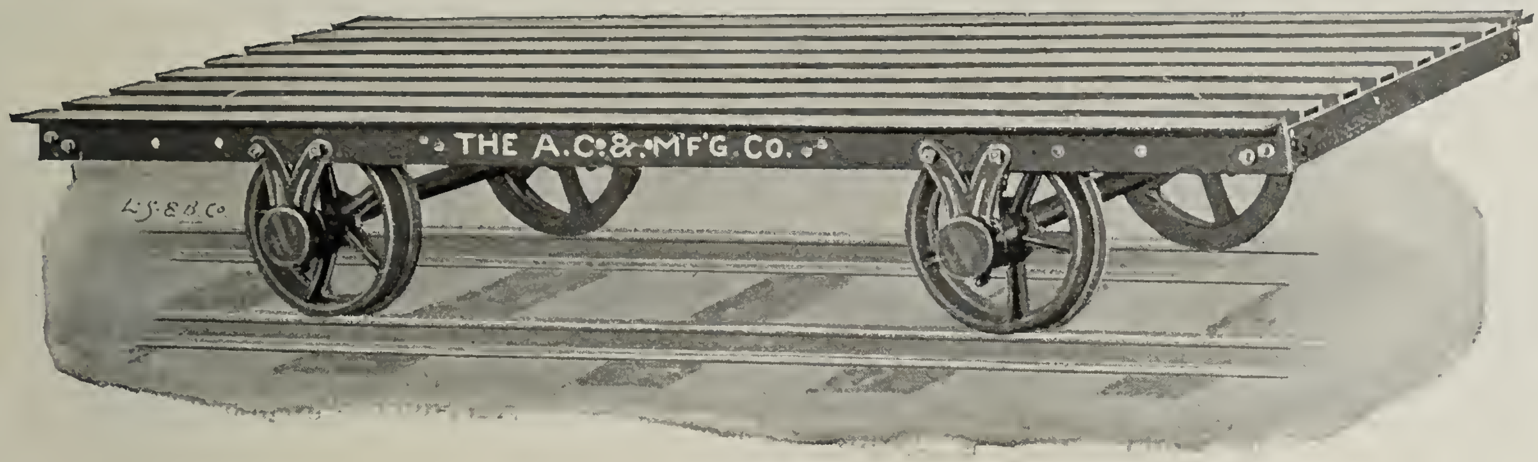
ODD LENGTHS OF RUBBER, AND GIANT RED STITCHED,

from 2 ft to 80 ft long, and from 1 in. to 16 in wide; 3, 4, 5, 6 and 8 ply FIRST-CLASS BELTING less than mfrs. cost prices. GET OUR PRICES on Rawhide, Paulins, Tank Pumps, Hose, Injectors Steam Gauges, Brass Fittings, Lard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Sawing Machines, One-Man Log Saws Asphalt Felt Roofing, Endless Thresher Belts. One Trial will make you a regular customer of the

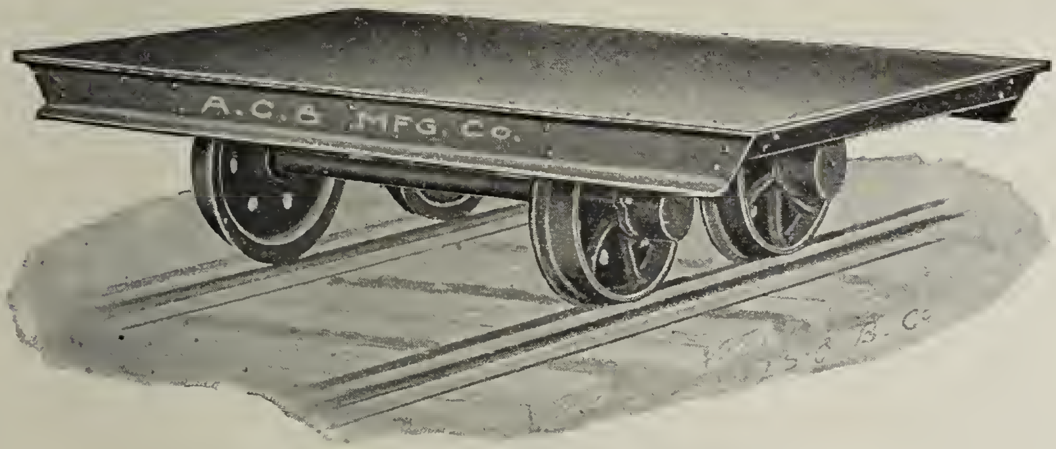
MILLER OIL & SUPPLY CO Indianapolis.

Send for Catalogue.

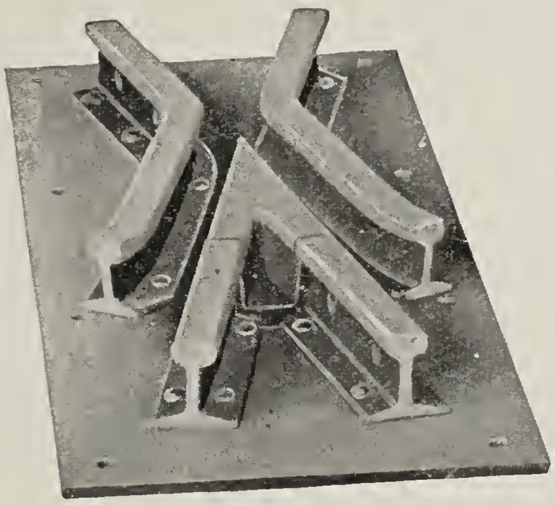
UNION STEAM PUMP
RUBBER BELTING


THE A.C.&.M'F'G. CO.

No. 108. Stiff Mud Flat Car. Steel Deck.



No. 114. Sand Lime Brick Car. Channel Frame.



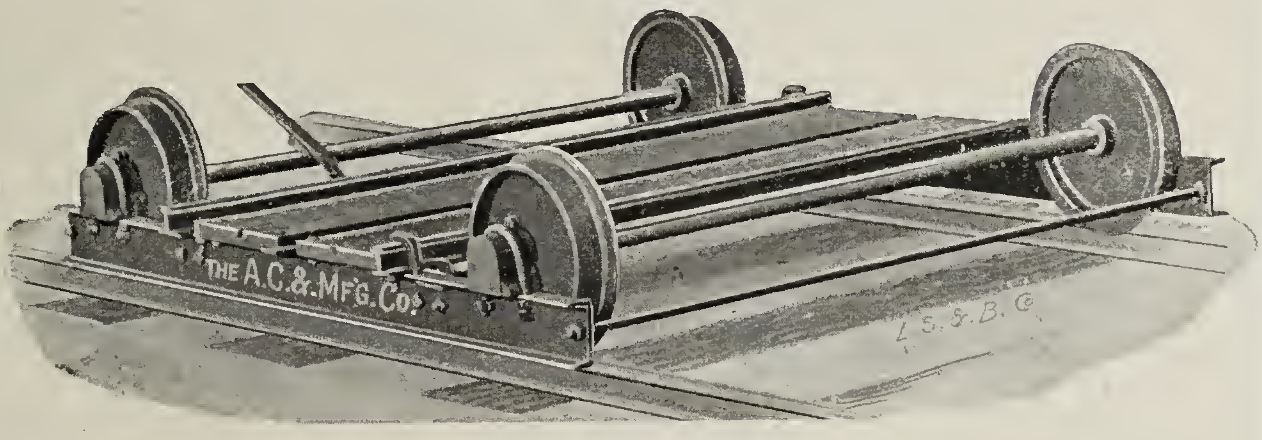
No. 1025. Steel Frog.

The Atlas Car & Mfg. Co.,

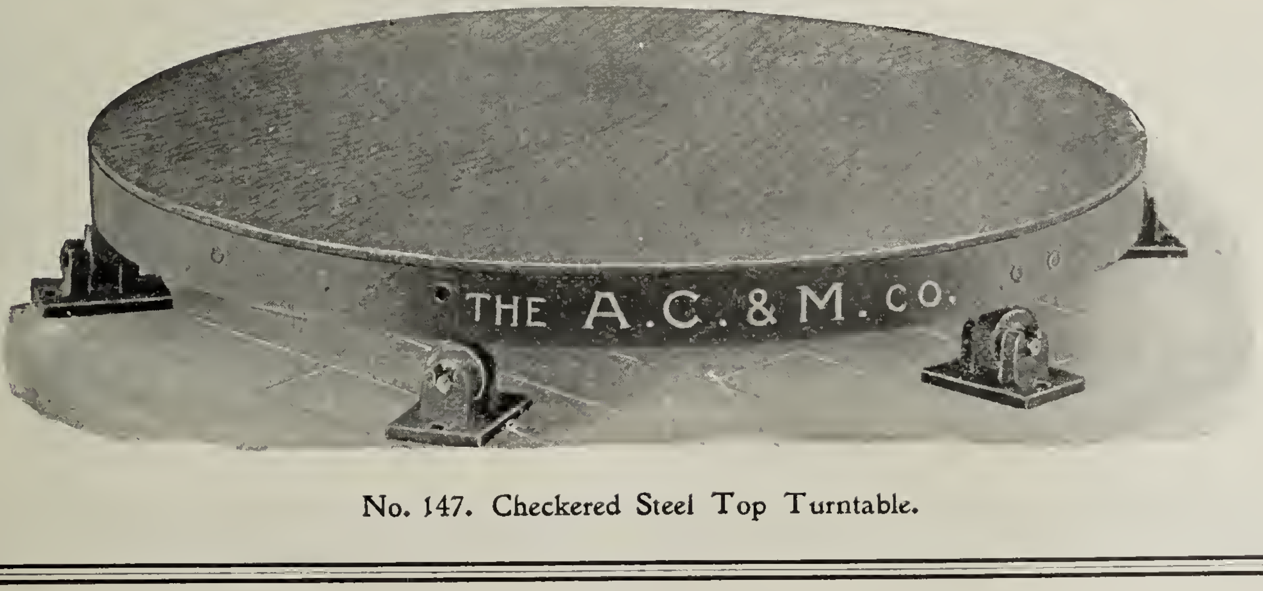
CLEVELAND, OHIO.

Manufacturers of Steel Dryer Cars of all Descriptions and Equipments for Hot Air Dryers, including Rail, Frogs, Switches, Steel Ties, Portable Track, Etc Also Transfer Cars, Turntables, Clay and Dump Cars.

No. A. Flanged Pallet


THE A.C.&.MFG.CO.

No. 142. Transfer Car.



No. 147. Checkered Steel Top Turntable.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE BUILDING OUTLOOK in San Francisco has improved rapidly since the close of the rainy season. Building operations during the month of April just closed reached a total of $2,100,000. This represents more than half a million more than the total for March and is considerably ahead of any previous month since the city's charter went into effect. On the whole, the outlook for the brick industry is rapidly improving. The demand for modern business structures continues good and rents tend rather to go up than down.

The Waterproof Brick Company has been incorporated here with a capital stock of $50,000. The incorporators are L. A. Steiger, C. Demetrak, J. H. Goldman, H. W. Bailey and C. H. Wilson.

The Wilson-Lyon Construction Company has been incorporated here with a capitalization of $750,000. The company will consolidate the interests of the Wilson-Lyon Company, the East Shore Brick Company and the Madera Granite Company. The company now has under construction a modern brick manufacturing plant at Point Richmond, on the east shore of San Francisco Bay. It has rail connection with both the Southern Pacific and Santa Fe Railroads. It will be equipped with machinery by the American Clayworking Machinery Company. Steam power will be used throughout, and the plant will have a capacity of 100,000 brick daily, which capacity may be doubled when necessary. Both commercial brick and vitrified paving brick will be made. Oil fuel will be used, together with down-draft kilns and patent dryers. The company has great hopes for the future of vitrified paving brick on this coast, as the recent tests have been entirely satisfactory.

The Novelty Pottery Company has been incorporated in Oakland, Cal., with a capital stock of $10,000. The incorporators are C. U. Barlow, F. B. Cook, N. S. Clark, J. S. Corrigan and R. H. F. Espey.

Machinery has been ordered for a new brick yard at Inglewood, Cal., which is being constructed by C. Forrester, who recently secured the contract for the outfall sewer, Los Angeles. It is claimed that the daily output of the new plant will be 100,000 brick, of which about half will be suitable for sewer construction purposes.

Articles of incorporation of the Union Brick Company have been filed in San Diego, Cal., with a capital stock of $25,000, fully subscribed by the following directors: James R. Wade, W. E. Wade, Homer G. Taber, T. R. Gay and J. A. Lindeman. The company has commenced the construction of several kilns in Rose Canyon.

George Farrington, of Imperial, Cal., has opened a brick yard at Calexico, and the first experiments in burning brick have been very successful.

The machinery for the vitrified brick plant located a few miles from Vancouver, B. C., on the Columbia River, has arrived and is being installed. The entire plant is being remodeled and enlarged.

J. L. Armstrong is making preparations to establish a brick manufacturing plant at Lebanon, Ore.

The case of the Stockton Brick and Pottery Company against the city of Stockton to recover $5,005, alleged to be due for sewer pipe, has been compromised. The sum of $4,135 was paid to the plaintiff corporation.

The new pottery recently established at Nampa, Idaho, was formally put in motion last week under favorable conditions. The first kiln will contain novelties and ornamental ware, after which a general line of crockery will be put on the market.

L. D. Macy, of Chico, Cal., has purchased eight acres of clay-bearing land at this place and will commence at once the erection of a brick manufacturing plant. The capacity of the plant will be from 20,000 to 30,000 brick per day, though at the outset it will not be operated to its full capacity. The plant will be operated by using wood as fuel, but in the near future it is the intention of the owners to install an oil-burning plant.

Dan O'Doan has established a brick yard at Fallon, Cal. A large kiln has been erected and the first brick will be burned this week.

Thompson & Garber have leased a seven-acre tract of land adjoining Oaksdale, Wash., and will move their $10,000 brick manufacturing plant from Almira.

Strikes are in progress in the building trades of various interior towns in California. Most of the builders in Sacramento have been out during the greater part of the past month. In Chico the bricklayers are on a strike for an increase of wages from $5 to $6 per day. In several other towns trouble is threatened.

Brick men in Los Angeles report that the outlook there is very encouraging. Architects report that pressed brick will be more generally used in Los Angeles than heretofore. The recent reduction in prices, together with the general tendency to employ more permanent material, has resulted in the substitution of pressed brick for other materials.

The Ogden Sewer Pipe and Clay Company of Ogden, Utah, has been enjoined from selling or disposing of its property. The bulk of the property of the company was to have been sold on April 21. The injunction was secured by R. S. Joyce, Thomas Maloney and the Eccles Lumber Company, stockholders of the company.

J. E. Heath, formerly of McMinnville, Ore., has purchased the J. E. Elkins property at Independence, Ore., and will open a tile factory at that point.

The city authorities of Cloverdale, Cal., are figuring on a proposition for establishing a sewer system in that town. The map is now being made of the proposed system, which it is believed will cost about $15,000. The plan contemplates the 10-in. pipe line for the main sewer, with branches 6 inches in diameter.

The city authorities of Mill Valley, Cal., have appropriated $7,000 to be used in extending the existing sewer system.

The city authorities of Oakland, Cal., have awarded a number of contracts for street and sewer work. John Geary has secured the contract for the construction of an 8-in. sewer on East Sixteenth street on his bid of 77c per lineal foot, and M. Murphy has secured the contract for an 8-in. sewer on Sixty-sixth street on his bid of 78c per lineal foot.

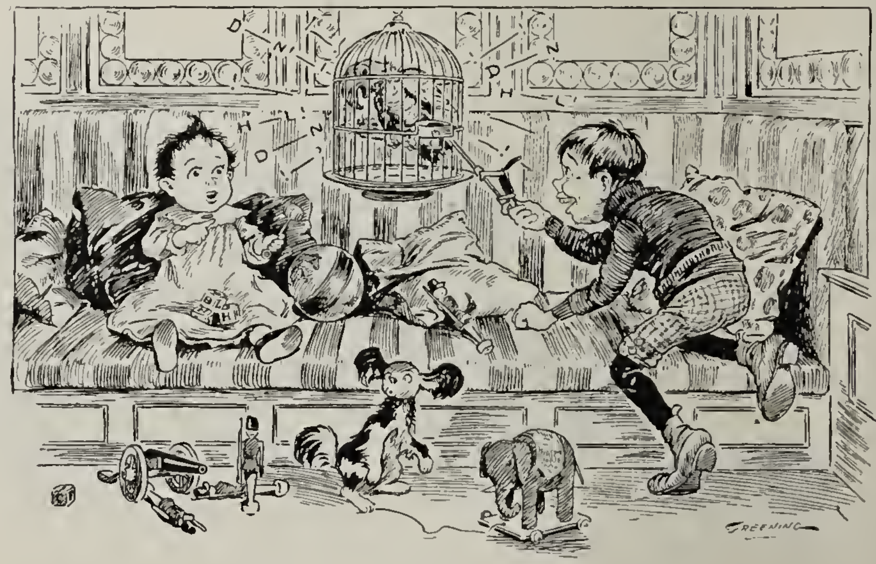
An election will be held at Ogden, Utah, on May 12 for the purpose of deciding on the issue of sewer bonds to the amount of $55,000. It is generally understood that the bond proposition will carry.

H. X. Goetz, a brick contractor of Santa Monica, Cal., has secured the contract for the brick work in the new Pacific Land Company building at Sawtelle, Cal. The building will cost about $10,000.

The Los Angeles Pressed Brick Company has purchased from the Sloan Clay and Development Company 320 acres of clay deposits near Corona, Cal., for $8,500.

Sunset.

San Francisco, Cal., May 5, 1904.



ASSISTING BABY'S EDUCATION.

Johnnie—"Well, if the baby learns any new words mamma can't blame it on me."—Judge.

FOR SALE.

The well-known plant of the Philadelphia & Boston Face Brick Company, the most complete moulded brick and brick mantel works in the country, together with the name and good will. Its goods can be found in all parts of the world. Over $90,000 has been judiciously expended in advertising and $75,000 in special machinery and moulds for the manufacture of its goods. There is no real estate.

The moulds were carved by John Evans & Company, and consist of 1,092 pieces or 145 different patterns.

By removing the works to a properly located clay bank a yearly profit of $30,000 and more can be made.

Works are now in operation, and can be seen by applying to

James & Abbot Company,

165 Milk St., BOSTON, MASS.

Written for THE CLAY-WORKER.

POTTERY NEWS.

THE ACME POTTERY COMPANY of Crooksville, Ohio, is now running along smoothly, making some fine ware, and orders are coming in plentifully. William Springer, the manager, and Thomas McNicol are very much pleased over the outlook.

T. D. Sweeting, who has been manager of the Sterling China Company at Sebring for the past two years, has resigned his position to accept a similar one with a new pottery company in Syracuse.

The Clinton Pottery Company, Clinton, Mo., was destroyed by fire. The plant was owned by P. A. Folkmer, of Kansas City.

The William Brunt Pottery Company, East Liverpool, Ohio, is installing some new machinery in their sagger department.

It is almost an assured fact that the recently destroyed plant of the George C. Murphy Pottery Company, East Liverpool, Ohio, will be rebuilt. They are now planning the new pottery and the work of rebuilding will no doubt be started soon.

A strike in the decorating departments of the Acme Pottery Ohio, held them up for a few days, but it has now been amicably Company and Crooksville Pottery Company, of Crooksville, arranged.

The Brian Pottery Company, whose plant at Trenton, N. J., was recently destroyed by fire, at a meeting of the directors held a few days ago, decided to rebuild the pottery and to modernize it in every department. The total loss, including both fires, will be over $75,000.

The foundations for the kilns at the new plant of the Columbus (Ohio) Pottery Company have been placed. The kiln builders will start work immediately. The buildings have been completed with the exception of roofing the kiln sheds. The plant will not be ready for operation for at least sixty days.

The East Liverpool Potteries Company recently filed with the Secretary of State an amendment to its charter, reducing its capital stock from $1,000,000 to $250,000, says an Ohio exchange. N. A. Fredericks is president and Fred B. Lawrence secretary.

The foundations are being put in for a large addition to the plant of the Mosaic Tile Company, Zanesville, Ohio. The buildings will be erected at once and new kilns will also be built soon.

The new plant of the C. B. Upjohn Pottery Company, of Zanesville, Ohio, is fast nearing completion. The buildings and kilns have been completed and the machinery is now being placed in position. Mr. Upjohn expects to be running within the next thirty days. The plant has two kilns and art ware will be made.

The J. B. Owens Company, of Zanesville, Ohio, have moved into their new offices. They have changed the location to the opposite end of the plant.

The buildings of the new additions to the plant of the Ohio Pottery Company, of Zanesville, Ohio, are almost equipped. The brick work has been finished and the carpenter work is now being rushed to completion. The bad weather has held up the work greatly.

The Texas Export Company is the name of a new concern just incorporated under the laws of Texas which will develop extensive clay lands that they possess, among which is some fine kaolin. The company have already purchased ground at Houston, Texas, on which to erect their claywashing plant and contracts have been let for its construction. The main offices of the company will be at Houston, and they expect to be able to begin shipping clay by June.

A new stoneware pottery is to be built some time during the coming summer at Elgin, Ill. They will erect a large plant and will have a capacity of two 25-foot kilns. The deal has already been closed and Samuel Robbins, who has been promoting the plant, will be the general manager.

Three car loads have left the Weller Pottery at Zanesville, Ohio, to be sold at the display at the Louisiana Purchase Exposition at St. Louis. The cars were filled with all classes of ware, including the very highest grade made at the plant. They anticipate a large sale at the exposition.

The Atkinson Pottery Company, of Haywards, Cal., will erect a new pottery in that city soon.

The pottery proposed for Scottdale, Pa., seems likely to be a "go," from present appearances. The new company is now being formed and it is stated they will have a capital of $50,000.

The Stourbridge Clay, Paint and Pottery Company has recently been incorporated in Passaic, N. J. They will manufacture clay, paint, earthenware, etc.; capital, $100,000; incorporators, Alex D. Bryden, Charles K. Schoonover, William Dassell, Charles H. Norris, John Kuhback, Honesdale, Pa.; Joseph P. Joyce, P. William Nelson, Oscar Olsson, Brooklyn, N. Y.; Herman V. D. Terhune, Passaic.

The exhibition pottery built by S. A. Weller at the Louisiana Purchase Exposition at St. Louis has been completed and will be ready for operation within the next two weeks. Mr. Weller is now at the plant superintending the finishing touches.

The Saenger Pottery Company, of Elmendorf, Texas, will make extensive improvements to their plant soon, and it is probable that at least one kiln will be erected. The company manufacture stoneware exclusively.

The Cambridge Art Pottery Company, Cambridge, Ohio, have just completed some much-needed improvements in their slip house. They report business as being very brisk and have all they can comfortably take care of. Their new "Gournsey" ware seems to be making a hit with the trade, as orders are exceptionally heavy for this class of goods.

The new Bell Pottery Company, of Columbus, Ohio, expect to be able to start up in full within the next few weeks. This plant has been delayed greatly and has been in process of erection for over one year.

TOM POTTER.

May 10, 1904.

FOR SALE, WANTED, ETC.

FOR SALE.

Good boiler and machine for tile and brick. Dies from 4 to 12 inches. Will sell cheap. Address
BOX 222,
Sioux Rapids, Iowa.
5 1 cm

WANTD—A good, reliable man of experience, with some money to invest to take charge of a proposed new brick plant to be organized for the manufacture of hydraulic press brick.
Tell City Improvement Association,
Tell City, Ind.
5 1 dm

FOR SALE—One Freese Brick Machine. 20,000 capacity. Used only three months. Also 70 h.p. boiler and engine, A1 condition. Machine in West Virginia. Address
TYGARTS VALLEY BRICK CO.,
No. 8 Prince Brick Apartment,
Washington, D. C.
5 1 cm

FOR SALE.

Complete wire-cut plant, Big Wonder, 4-roll compound crusher, granulator, double-geared pug mill, belted conveyor, 24-inch belt, $850. A Penfield Upright Soft Mud Brick Machine, with 9-ft. pug mill attached, iron frame, 2-roll crusher, with steel cutting bars in one roll, belted conveyor, with all shafting and pulleys, $450. No. 2 Williams Pulverizer and a 40-inch Stedman.
MERTES MACHINERY CO.,
Milwaukee, Wis.
5 1 dm

FOR SALE.

1 Martin style B soft mud machine with pug mill.
1 Anderson soft mud steam power machine.
2 Monarch soft mud machines.
1 hand cutting table.
1 iron horse power soft mud machine.
1 iron steam power soft mud machine.
1 60 h.p. boiler and 50 h.p. engine.
1 35 h.p. boiler and 1 25 h.p. engine.
1 20 ft two-flue boiler.
1 5-ton cupola, blower for same.
2 tumbling barrels.
1 24-ft. gasoline machine.
THE HORTON MFG. CO.,
Painesville, Ohio.
5 tf L

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

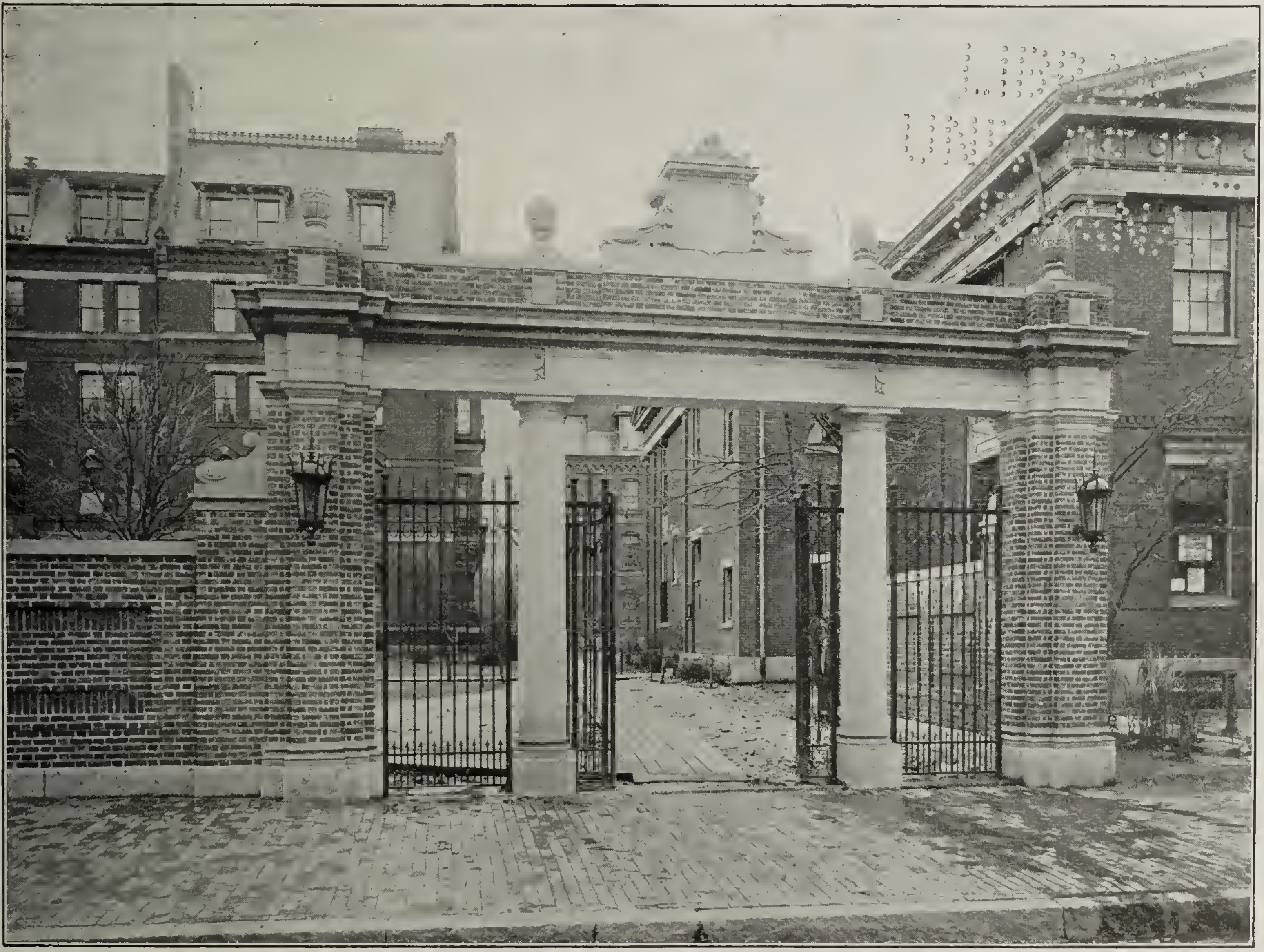
VOL. XLI. INDIANAPOLIS, IND., JUNE, 1904. No. 6.

Written for THE CLAY-WORKER.

EXAMPLES OF AMERICAN ARCHITECTURE.

THE SUPERIOR value of brick from an economic view point is not fully appreciated even by architects and builders. Everybody concedes that brick is the one indestructible building material, but the full significance of this is not often considered. In our daily walks, we see buildings torn down and the brick being cleaned and carted away for use elsewhere, or piled up for use in the new building to take the place of the old one, with but little thought as to the economic phase of the situation. Most of the other materials in the old building go to the scrap heap, being worse than valueless, for it costs money to haul them away. The brick alone being of value equal almost to their original cost. This is a matter to which builders should give more heed when figuring on the first cost of brick structures, compared with frame and stone buildings.

A notable use of old brick to a fine advantage from an artistic point of view, as well as the economic, is that of the early Harvard Gates. There are a number of these structures, and while they vary in style and form, they are all attractive, not alone because of their substantial character, but because of their artistic merits. The first of the Harvard Gates were built of old brick that were a part of the original buildings which were torn down to make room for more modern structures. The one shown in the accompanying illustration is of later date, and


Memorial Gate, Class 1875, Harvard University, Boston, Mass.

while it may have been built of new brick, it is not more pleasing in appearance than the others, several of which have been illustrated in THE CLAY-WORKER on previous occasions.

These Gates are laid in Flemish bond with large joints, no attempt being made to secure uniform color. These Gates represent the most successful examples of our modern imitations of the old Colonial designs. It may be interesting to consider what is implied by the term "Old Colonial" design. We all know that it was in architecture developed during the early settlement of this country, but not all of us are aware that this veritable Old Colonial work is the only example of a characteristic and typical architecture which has ever been developed in this country. As much as has been said about our enterprise, originality and liberality in building work it is true that the sole and only architectural development in creation was a style during the Old Colonial period. For refinement, expressiveness, truth and character no architectural work of ours can begin to compare with it. It stands alone as our one worthy architectural effort.

We have built elaborately and lavishly in other styles. We have built great churches and cathedrals in imitation of the architectural work of the mediaeval period. We have gone back to the work of the Greeks of the fifth century B. C., we have imported from the Romans and have drawn on the period of the French and Italian renaissance, but this work in these styles has been literally transported. We have added no element of character or vitality from our own modern life. We might quite as well remove many of the buildings themselves from Italy, from Greece or from France. Most of our building work where this method of transportation of style has been pursued has amounted to little more than house moving. True, this work has been done through the medium of photography, prints and drawings, but the forms have been as exact as though the stones and the brick themselves had been transported to us.

This was not true of the Old Colonial work. While it had Roman tradition suggesting its detail, the composition, the arrangement, the adaptability and the freedom were of the Old Colonial period. It was true and expressive. A very interesting fact in connection with this Old Colonial work is that in New England it had one expression and certain definite characteristics, in the Middle Atlantic States another and in the southern part of the United States yet another distinctly marked character. As shown in these gates the New England Old Colonial architecture was simple, severe, almost cold. It was expressive of the rigid life, the simple manners and the exactness of the early New England character. The Old Colonial of the Southern and Middle Atlantic States was more sumptuous, and richer in detail, partaking more of the character of a people less rigid and certainly warmer in temperament. One finds a Colonial architecture in the lower part of the Mississippi Valley that is really quite rich and profuse in its decoration. It is interesting to note also that the workmanship upon the New England structures of this time was better than that of any other section of the country. In the Old Colonial work we have the only period in the history of American architecture when the people properly and adequately expressed themselves in their building. With all our wealth of opportunity, our vaunted culture, our great educational development we have not been able to develop an architecture to compare with the Old Colonial for truthfulness of expression and high artistic worth.

The Harvard Gates taken together represent about the best of the architecture of that great educational instituion. There is a unity and dignity shown in these structures which does not appear in other Harvard structures. Harvard College has a number of fairly interesting buildings, but none which are in any large measure satisfactory. One of the best is Sevier Hall, another is Randolph Hall. Both of these are of brick. The Law Library, a stone structure, by Richardson, is successful in spots. It has a beautiful entrance, some beautiful windows, but on the whole, the composition is very unsatisfactory. Beautiful windows and beautiful doors do not make a beautiful building unless they are properly related. One finds less to criticise in the Harvard Gates and really more to commend than in any part of the Harvard work. One may notice in the buildings which show in the photographs that they are far from possessing the same high character as the gates.

LOUIS H. GIBSON.

THE VALUE OF OUR CLAY PRODUCTS.

A Graphic Exhibit by the Clay-Worker at the St. Louis World's Fair.

ONE OF THE MOST interesting and perhaps most surprising features of the clay exhibits at the great World's Fair is a chart prepared by THE CLAY-WORKER, showing the value of the clay products of the United States compared with some of our mineral products, a copy of which is shown herewith.

This chart has been compiled from figures furnished by the U. S. Geological Survey, those relating to the clay products being taken from the report on the statistics of the clayworking industries of the United States by Jefferson Middleton, a member of the N. B. M. A. committee on the clay exhibits at the World's Fair. The other figures are taken from the report of the Geological Survey Mineral Resources of the United States, 1902.

It shows graphically how the value of our clay products has increased from $74,487,680 in 1898, to $122,169,531 in 1902. The chart also shows that some of the most important mineral products are far exceeded in point of value by the clay products of the country. Perhaps to the average mind gold and silver are our most important minerals, and of course from some points of view this is true, yet during no year shown on this chart, surprising as it may seem, did the value of gold or silver product equal that of our clay products. In fact, in the last year shown, 1902, the clay products exceeded in value by some $13,000,000 the combined value of our gold and silver product, the figures being, gold and silver $109,415,000; clay products $122,169,531. For a majority of the years shown, the value of the brick and tile products is greater than the gold produced in the corresponding years. Copper, except in the years 1899 and 1900, when the highest prices for that mineral known in the history of the industry prevailed, has to take a back seat to the humble clayworking industries. When the value of the two products is considered petroleum, which has been so much in the public mind, falls far below the value of the clay products. Stone, which comes into competition with clay products for structural, engineering and paving purposes is shown to be much less in value of output than even the brick and tile products. The value of the cement product is almost insignificant as compared with the brick and tile products in the years shown; yet the rapid rise in the value of this product from less than $10,000,000 in 1898 to over $25,000,000 in 1902, gives an idea of what may be looked for in this rival, in many fields, of the clayworking industries.

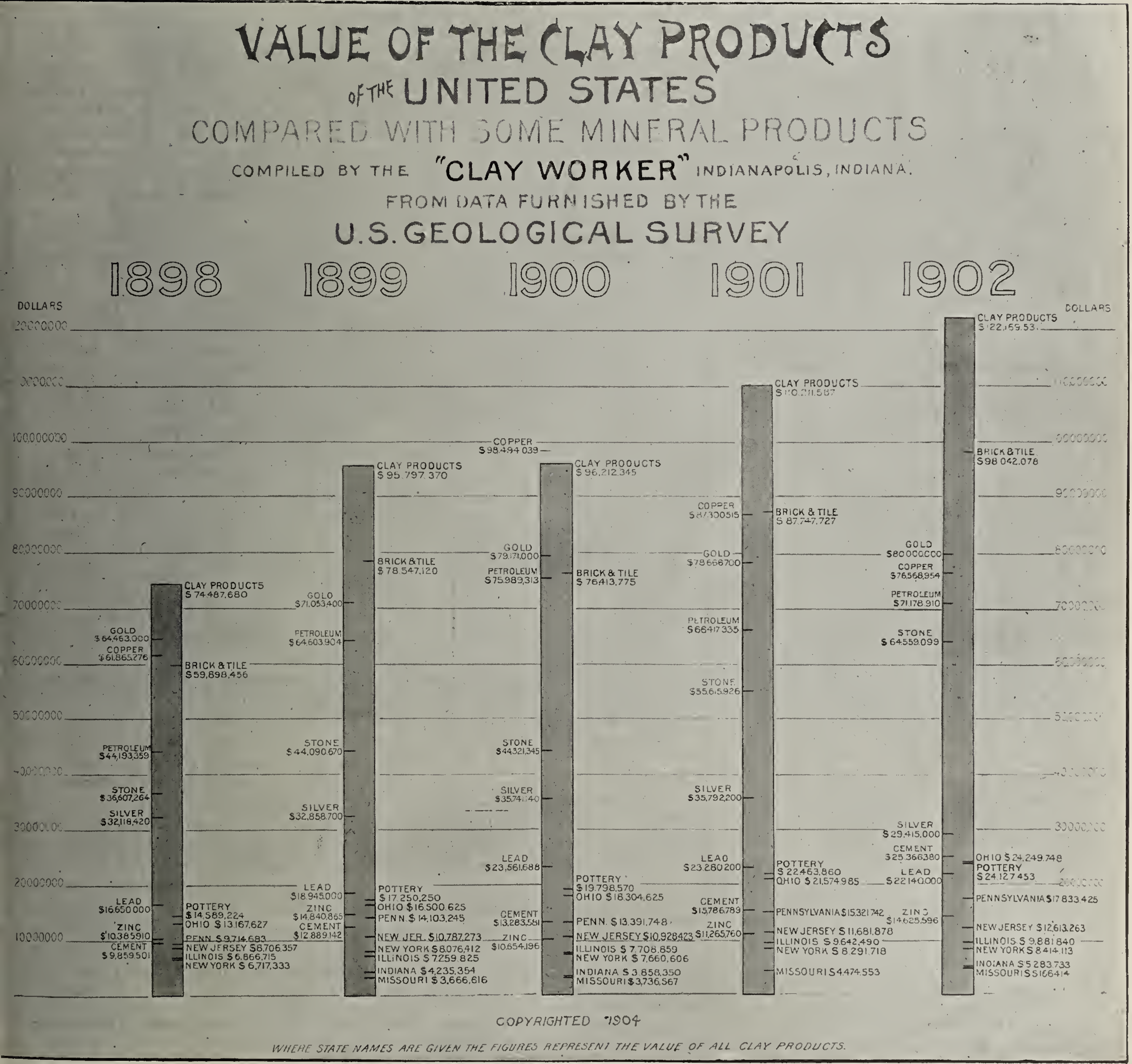
A notable feature of the chart is the remarkable coincidence of the total value of Ohio's clay products with the total value of the pottery products of the country. In 1898 the pottery products were valued at $14,589,224, while Ohio's clay products were valued at $13,162,627; in 1899 they were respectively $17,-

250,250 and $16,500,625; in 1900, $19,798,570 and $18,304,628; 1901, $22,463,860 and $21,574,985; and in 1902, $24,127,453, and $24,-249, 748.

This chart also shows the proportion of the total products made by the leading clay-producing States, with the total value of the product made by each State in each year. Ohio is, of course, the leading producing State followed by Pennsylvania, New Jersey and Illinois in each year in the order named, except in 1899, when Illinois was displaced by New York.

Taken altogether, this chart must attract a great deal of interest, as it shows in a way never before attempted, the importance of our industry compared with some of the greater mineral products of the country.

Expert Burners.—Wherever a number of brick manufacturers get together and talk about their business the complaint is always heard of the difficulty in finding burners who really understand how to produce a good ware in the kilns they have in charge and at the same time use the smallest possible quantity of fuel. Unfortunately the master is, often enough, unable to give any help in the matter of economizing fuel. These conditions have induced the Association of Clay Ware Manufacturers to take up the question of providing teachers in the shape of expert burners, and the plan of providing them will be immediately put in operation. To cover the cost of an instructor in burning, the brick manufacturer who requires the assistance of an instructor will pay 15 marks ($3.52) per day and provide board and lodging, the money to be paid in advance. It is clear that this will by no means cover all the expense, as the man must be paid his salary during the time he is not occupied. The association will make good this difference, also pay the expert's traveling and other expenses out of its own funds; this it will do in the interest of its members, for whom alone the instructor is permitted to work. The executive of the association is convinced that all the members will hail this action with delight and will call upon the instructor to help out their own burners. This will not only benefit the manufacturer who complains of too great a consumption of fuel or of badly burned bricks, but it will be valuable to



WHERE STATE NAMES ARE GIVEN THE FIGURES REPRESENT THE VALUE OF ALL CLAY PRODUCTS.

the one who wishes his burners to be put in the way of doing the work in the best manner. How desirable such instruction is, even for good burners, may be judged from a recent case where the president of one of the local associations, whose burners were considered competent men, called in the assistance of an instructor, with the result that the consumption of coal was reduced, effecting a permanent saving of 78 pfennigs per thousand bricks.—*Thonind. Z.*

Written for The Clay-Worker.

SALT GLAZING.

How to Fix the Draft for Different Clays—How to Create Oxidizing and Reducing Atmosphere.

IN BURNING CLAY-WARE to be salt glazed, the last stage of the burn, namely the glazing, is a very important manipulation and the value of this kind of ware depends to a great extent on the results of the salting. But all you have to do is to throw the salt on the fires when the kiln is burned hard enough. Oh no! The kiln of ware may be burned hard enough, the heat may have been lost by too slow firing, so the fire holes may be dirty, full of dead ashes and clinkers, and of course the heat in consequence is not sufficient to decompose the salt or change its composition and you can never glaze the contents of the kiln, no matter how hard burned, the heat must be there. In fact you can glaze a clay with a medium hard burned body easier when you have the right heat, than you can glaze a hard burned body with not sufficient heat. To prove this: Burn a kiln of sewer pipe hard enough to a body when you know it will take a salt glaze, and then let the kiln cool, let the fires burn down and then throw in the salt. The result, is no glaze. Why? Because there was not enough heat in the fire holes to change the composition of the salt, and the soda, the glazing substance, never enters the kiln, but it melts and runs down through the grate bars in the ashpit or it runs on the clinkers and only the chlorine, which is the bluish vapor, escapes through the stack. And another thing, in losing heat before or during salting, hardens or chills the surface of the ware to be glazed and even if you had enough heat to decompose the soda in the salt, it would slip off and not unite with the silica. Again no glaze, the result. At the time when pipes are in condition to take a salt glaze, they are in a somewhat soft and waxy condition, which is proven by pipes leaning against each other, when they have become crippled out of shape. There is a belief that only the surface of the pipe is soft, caused by the soda and the silica fusing together to form the glaze, that only this glaze is soft. I say: O, no! again. If that was so, how would it be possible that double strength pipe two inches thick get out of shape? The glaze only as thick as stiff writing paper would not bend a piece of clay two inches thick out of shape. It shows plainly, that the whole structure of the pipe is in a soft condition, at the right salting temperature. I believe though more so on top in the kilns, or else the bottom pipe would go down from the weight on top of them, and especially in a weak clay. That goes to show why the top pipes of some shales are so much nicer glazed than the bottom pipe. If the burner would go as far with the heat on the bottom pipes as he does with the top pipes, the former would go down, and if that happens and you want your bottom pipes glazed, then put some clay in your pipes that will stand a salt-glazing heat without getting too waxy on top, before the bottom pipes are also waxy enough to take a good glaze and that clay you need is a fire clay. If 10 per cent. of it won't do, use 25 per cent. or 50 per cent. or as much as gives good results. Let the burner find out how much you need and not the shop foreman. He does not like too much mixing and he will "bust" a company before they catch on and find him out.

DRAFT IN SALT GLAZING FOR A WEAK CLAY.

We know a weak clay always burns to a weak body and such clay is hungry for oxygen, therefore needs a good draft, open fires and in other words, a clear heat, free as possible from flame and smoke, for with a reducing atmosphere such clay will easily burn up. When salting such clay, no black smoke should come in contact with the salt. If you reduce the draft in salting to create a reducing flame such clay burns to a blue-black body and at that stage becomes so soft, that the top generally "cripples" and gets out of shape before you get through with the kiln and glazing the bottom pipes. My advice for such clay is, good draft, clean oxidizing fires, light and frequent firing, and when ready to glaze, salt quick and do not monkey with it too long, let good enough alone. Do not let anybody make you believe that you get too much draft, do not let them make you drop the damper, to hold the heat in the kiln. If you do, you overheat the top. Give the kiln good draft, follow up the heat passing through the stack by frequent light firing, that is what the stack is there for, to pull the heat down from the top and you need it for certain kinds of clay. If you find that your trial piece does not take a good glaze after a salt or two, of course then you lower a damper and fire heavy, then your stuff will glaze. I know it will, but your pipe when coming from the kiln don't look like your nice glazed trial, they may be all out of shape, worthless. Not what you put in a kiln but what you take out, is what counts. Be careful what you do with the damper in salting a weak clay. It does not look dangerous, but it is and it is very dangerous for pipe made of shale. If a shale pipe does not take any glaze with a good draft, quit salting and keep on firing until ready to glaze, but do not drop the damper. You may have to lower it some, but not enough to make the kiln smoke heavy, oxidizing atmosphere to the end gives bright glaze and smooth pipe, reducing flame cooks the iron out and culls will be trump instead of No. 1's.

Burning shale pipe is a science that means to know how.

DRAFT IN SALT GLAZING WITH FIRE CLAY MIXTURE.

In this case we need a reducing atmosphere. We can get a glaze without hurting the top pipes and a dark glaze too, which is in demand in some places. An oxidizing heat, in other words a strong draft which burns up the coal, and consequently the carbon, or black smoke, would produce a glaze of light color; and even if the pipes were burned hard, they would look like soft pipes on account of the light glaze, and still it is a proven fact that such a pipe stands more pressure than a dark glazed pipe with a blue edge or a blue center. This kind of pipe makes some engineers believe they are extremely hard, when in fact they are rotten. Now the way to handle such pipe in burning is to have a good draft and burn to a clear body, then when salting drop damper until salt vapor shows through the trial piece hole, which you loosen a little. Of course you must not fire too heavy so you will have rough pipes; under very heavy firing the iron cooks out and this is objectionable.

When you have a coal which contains much sulphur, you must pull your damper up and give the kiln full draft, as soon as you succeed in getting a good trial piece. Why? Because, if you let the damper down the sulphur fumes cannot escape fast enough and they will destroy the glaze and when you open the kiln the glaze is dead. A little practice will teach a burner how to handle his clay in regard to draft in salting. What will do for one clay may not do for another clay. Clay is something that behaves wonderfully strange sometimes, and an average lifetime is too short to learn all about it. Puzzle after puzzle will have to be solved and difficulties must be overcome. I am astonished at the wonderful nerve power of some burners, who tell people they can handle any kind of clay successfully. The man who can do this was never born and never will be—he who boasts will find out in the end that he does not know it all and never will.

More of this in the next chapter. A. V.

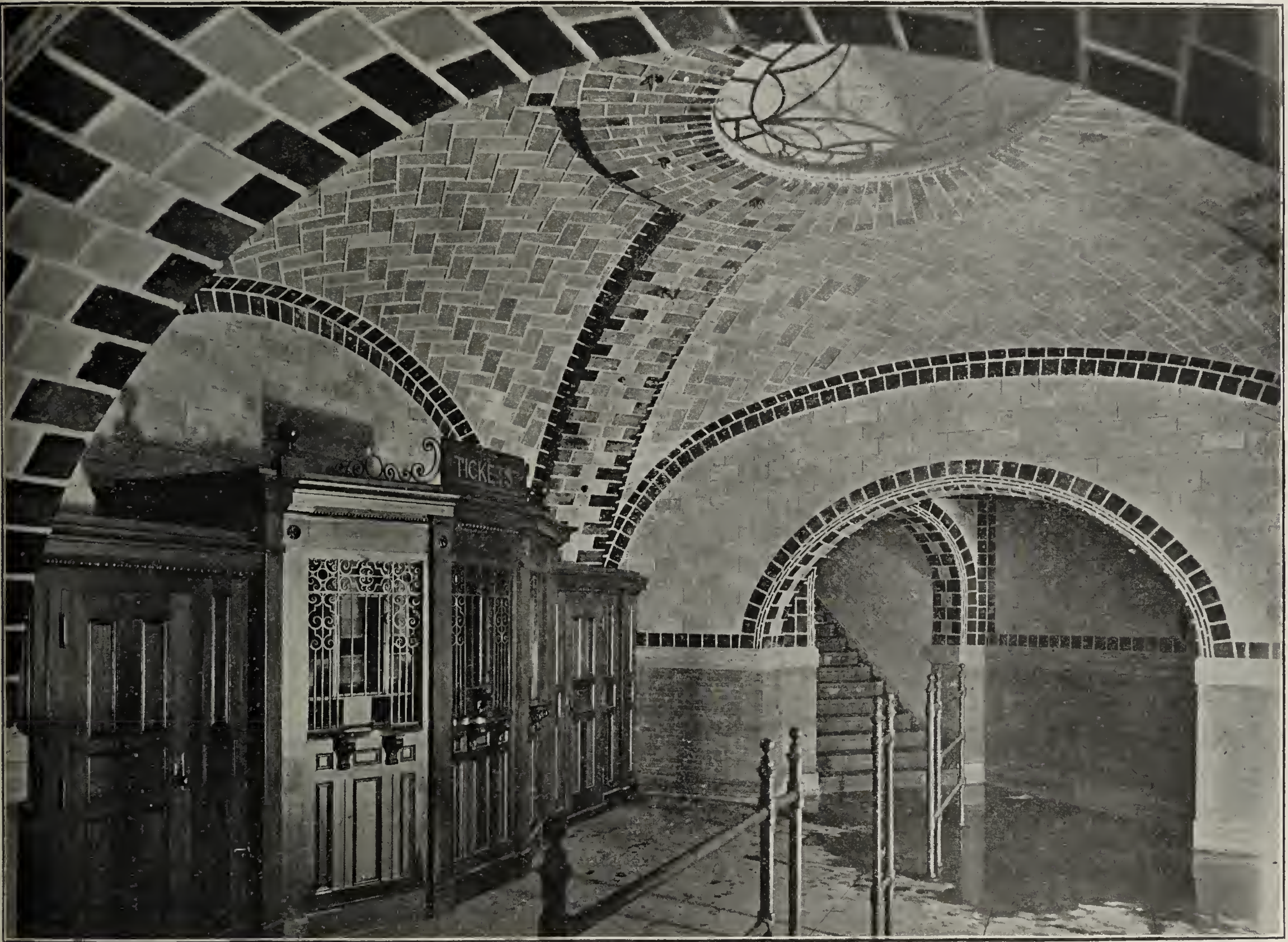
Hold your own opinions, but don't force them on your neighbor. He may have opinions of his own. Dunn.

Written for The Clay-Worker.

NEW YORK SUBWAYS.

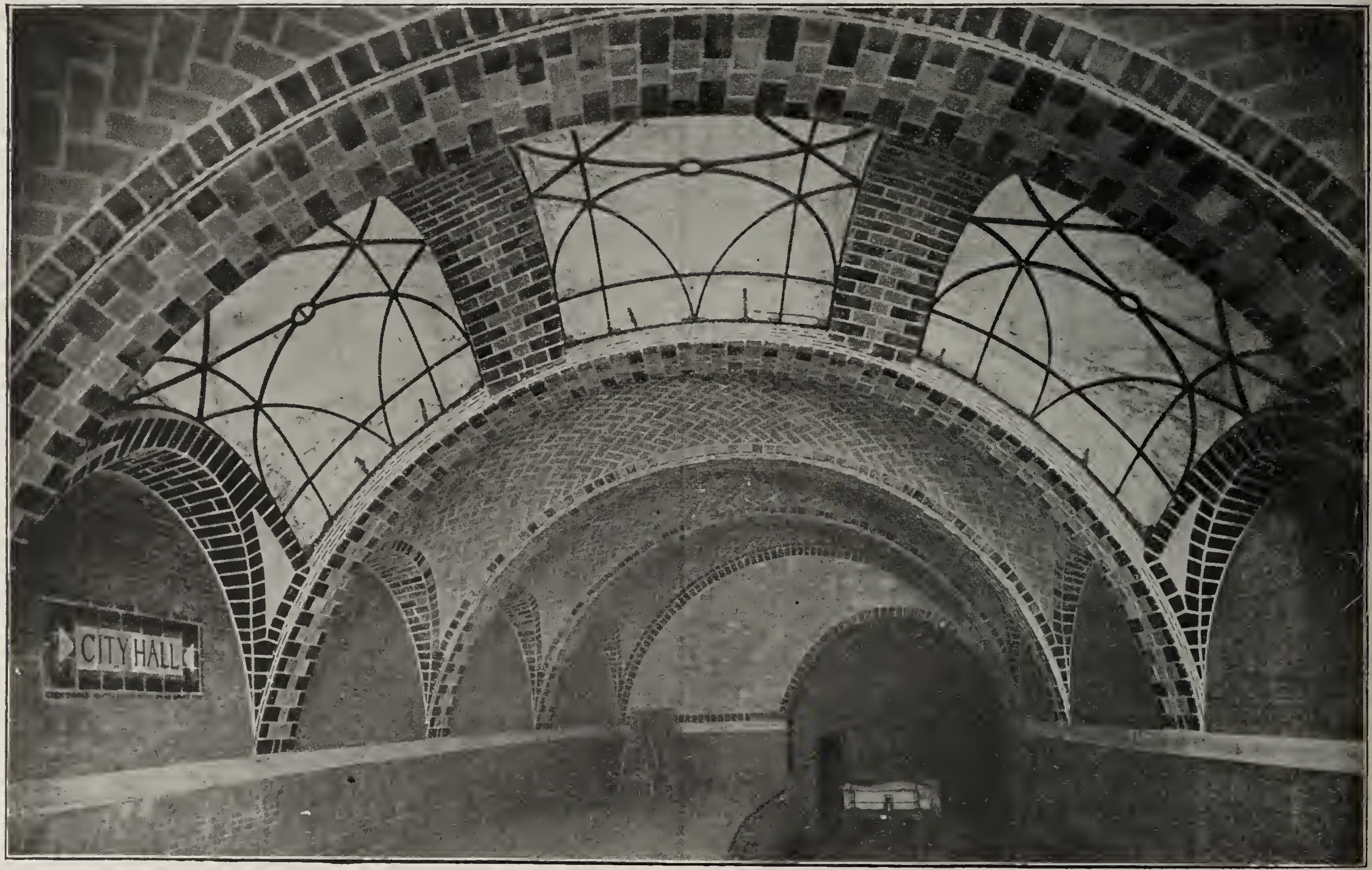
Where Immense Quantities of Brick, Terra Cotta and Faience Have Been Used.

THE QUESTION of rapid transit in New York City justified the letting of a single contract amounting to over $35,000,000. This is certainly one of the largest contracts ever let. It involved not alone the construction of great subways and the motive power for the conveyances which they contained, but the reconstruction of many sewers, the relaying of many water pipes, steam pipes, and electric conduits and provision for foundations under great structures. The pictures which we publish are of substations and indicate that the work has been done not alone with regard to the highest engineering knowledge, but that united with it is the spirit of aestheticism. The engineering forms, the structural demands having been met in this work has been beautifully decorated. The engineer and artist have sympathetically joined hands and we have work quite as beautiful, quite as decorative and interesting as the great artistic crypts under the old cathedrals built during the middle ages. In truth, there is nothing in our modern structural work which in form is so nearly allied to the old mediaeval crypts which were the basements and sub-basements of the great cathedrals. While they were essentially structural they were built at a time when the spirit of the workman never permitted the artistic effect to be lost sight of. When we have spoken of the similarity in form existing between the earlier structures and those of the substations in New York, we must cease to make comparisons. In this latter day the spirit of commercialism asserts itself, and the character of the surface and decoration must be such as to lend itself to brilliant and economical lighting. This is done through the use of the vitreous enamelled surfaces, enamelled terra cotta, and through variation of color and form. The reflective quality of the vitrified tile and brick serves not only as an artistic, but a materialistic purpose. White tiles and enamelled brick were used very largely in the Boston subway. In no instance has the artist secured such brilliant results as we find in the New York work. Subway construction and great tunnels under rivers are the natural outcome of the tall building. The streets of New York and Boston were full narrow for buildings three and four stories high. Many of them were originally mere roadways and were possible of use with relatively low buildings. But when the tall structures were placed on these streets, buildings ten, twenty, thirty and more stories high the congestion became so great that travel by means of surface roads or even elevated roads is impossible. At best the elevated road was an expedient. It had to be confined to the streets and alleys and was destructive to property values. The elevated road is as noisy as it is ugly. The possibilities of the subway are unlimited excepting for the necessary supports of the structures which come above. However it is an engineering possibility to place under the larger portion of the surface of a great



City Hall Station of the New York Subway.

city thoroughfares for the movement of the people and general commerce. The street area is necessarily restricted. Not so the area to be used for underground transit. So far as it may appear desirable these passageways may be made beautiful and always cleanly and generally attractive, and that in this work the product of the clayworkers' kilns plays a conspicuous part is shown by the accompanying illustrations for which we are indebted to the *Brick Builder.*



City Hall Station of the New York Subway—page 705.

CLAYS IN THE PATOKA QUADRANGLE.

IN DESCRIBING the mineral resources of the Patoka quadrangle, Messrs. M. L. Fuller and F. G. Clapp of the United States Geological Survey have made a concise summary of the clay resources of southwestern Indiana and southeastern Illinois.

The clays of this area fall into two general classes—(1) fire clays, or the refractory clays occuring beneath the coals and elsewhere in the Carboniferous formations of the area, and (2) brick clays, including the less refractory clays, argillaceous shales, till, loess, and alluvial clays.

The fire clays occur in beds of rather widespread distribution beneath most of the coal seams. East of the Wabash the thickest beds known are at Princeton, where they have been penetrated by several borings and by a shaft at the coal mine. One of these beds, 1 to 7 feet thick, is said to be suitable for the manufacture of terra cotta and similar products. Another bed, consisting of tough, plastic fire clay, 1 to 3 feet in thickness, appears to possess high refractory properties. Outcrops are found 3 miles east and 1 1-2 miles north of Princeton, and at both these places the clays are said to be of excellent refractory quality and to have been used locally in making fire brick for furnaces and kilns near Princeton. At the southeastern edge of the quadrangle the Evansville mines show fire clays beneath both clay beds. In Wabash County, Illinois, fire clays have been reported in a number of deep wells.

Clays useful in the manufacture of common building brick and drain tile are of wide distribution and are worked at a number of points. The most valuable deposits consist of loess and of argillaceous shale. The shales, known locally as "soapstone," are abundant throughout the quadrangle. The colors vary from blue to buff. They are often almost free from grit and where weathered are soft and soapy, although in fresh exposures they may be firm and hard. The largest pit is operated by the Evansville Pressed Brick Company. The clay is mixed with the overlying loess and enough argillaceous shale to form one-fifth of the whole. This mixture is said to make a valuable vitrified brick, which is strong, tough, and non-absorbent. An exposure southeast of Princeton shows a combination of soil and loess, sandstone and gray argillaceous shale which would make a good paving brick. Aside from these two instances, shale is not known to have been used in the quadrangle.

A number of pits in the loess now furnish brick clay of good quality. Two of these are located at Princeton, two at Mount Carmel, and one or more each at Owensville, Haubstadt, Cynthiana and Poseyville. At Evansville, just outside of the limits of the quadrangle, a score or more pits are worked. All the companies make soft mud brick, and occasionally small outputs of tile are reported. The plants generally run only five or six months of the year, and the entire production is usually retailed within a few miles of the kilns.

Till or hard pan is not known to have been used in the quadrangle for the manufacture of brick. Although the more clayey forms of the till are often suitable for making a fair grade of brick, the loess is of such superior quality for brick making and so abundant that it is unnecessary to use the poorer material.

The price of the Patoka folio (No. 105) is twenty-five cents. It may be obtained from the Director of the United States Geological Survey, Washington, D. C.

Written for The Clay-Worker.

CLAY DUST. No. 12.

By A. Lumina.

"WHAT ARE THE advantages and disadvantages in using permanent kiln walls with outside up-draft furnaces as compared with burning coal directly under the brick, either in scoved or permanent walled kilns? All brick loaded on trucks for delivery."

This question, which comes through The Clay-Worker, gives me an opportunity to discuss a subject that has often been brought before me in one way or another. The general subject to which this question leads involves all the conditions that should govern the selection of a kiln for any purpose. The more experience and observation one has in the brick business, the more forcibly he realizes the fact that no form of kiln, however well designed, is adapted to the use of all, or even to a large portion, of manufacturers. Taking up now, however, the special question stated above, and knowing nothing of the conditions, except that "all brick are loaded on trucks for delivery," some facts and arguments could be presented that should be of help to this inquirer and to many others.

The up-draft kiln for common brick will probably continue to be used for many years after I am out of the business, though it must eventually be superseded on permanent plants, by a kiln giving a larger percentage of first quality brick and less wasteful of fuel. The question is then how far will it pay to carry the improvement in the up-draft kiln. The great obstacle to the more extended use of the down-draft and the continuous kilns for common brick is the large investment required; but the improvement of the up-draft kiln, permanent roofs, special furnaces, and perhaps permanent flue bottom, that the cost of construction will be so near to that of the down-draft or continuous kiln that it would be wiser to build these other forms of kilns that have so many advantages over the up-draft. In other words, rather than go to so much expense in building the up-draft, why not build the down-draft or contniuous kiln, which would cost but little more and would give much better results? Hence, it is a question whether in most cases the common scoved kiln, with no permanent walls or furnaces, is not more profitable than the most improved permanent walled kiln.

The advantages of the scoved kiln, with fires directly under the kiln in arches set in the brick are:

1. No large investment in kilns that may become a valueless asset upon the abandonment or movement of the business.
2. A continuous kiln floor and shed parallel to drying yard or drier, every foot of which can be used in rotation and upon any part of which not in use brick can be set.
3. Convenience of getting brick to the place of setting.
4. Convenience of getting coal to kiln from R. R. tracks running on each side parallel to kiln.
5. Convenience of loading wagons direct from the kiln, the teams driving crosswise of the kiln.
6. The being able to use the kiln space for setting immediately following the emptying.
7. In some cases, especially where wood or anthracite are used for fuel, and the clay is not seriously affected by rapid heating and cooling so as to spoil the arch brick by checking, it is an advantage to have the fuel directly under the brick from the heads to nearly the center of the kiln. It is also more economical of fuel.

The disadvantages of the scoved kiln are:

1. Expense of putting up and taking down the scoving at every burn.
2. The greater loss of heat from radiation of the thin walls of scoving.
3. More soft brick around the outside of the kiln.
4. More overburned or checked brick in the arches.

The advantages of the permanent wall, furnace, up-draft kiln are:

1. No scoving to put up or take down, except for the doors.
2. Less loss of radiation through walls, hence less soft brick around the outside.

The disadvantages are:

1. Large investment in kilns.
2. Not so convenient to empty—wagons must be backed into kiln.
3. Kilns must generally be placed at right angles to yard or drier, thus requiring the wheeling or carting of the fuel between the kilns.
4. None of the kiln can be used for setting until the whole is emptied, thus requiring a larger kiln space and larger investment for a given capacity.
5. Loss of heat radiated from the furnaces.

SUMMARY.

Figuring over both sides of this question I come to the following conclusions in reference to kilns for common brick:

1. Where fuel is cheap and the clay gives no special difficulties in burning, and the market requirements are not severe, and the brick are loaded upon wagons for delivery, the scoved kiln, properly handled, is most economical.
2. Where fuel is high, or where the market requires all hard brick, or where the clay checks easily from rapid changes of temperature or exposure to air during firing, the continuous annular kiln is most advantageous.
3. Where fuel is cheap and the market requirements are for hard brick of good color, or where the brick are mostly loaded in R. R. cars for shipment, the down-draft kiln, preferably round, is to be recommended.
4. If the common brick are made by the dry-press process, or are made of shale by the stiff-mud process, it is advisable to use the down-draft or continuous kiln, whatever the other conditions may be.
5. The above conclusions leave no room for the improved and expensive up-draft kiln with permanent walls and furnaces.

"Should furnaces be entirely outside of main walls or under the same, and as near to burning brick as possible?"

I don't know who sent this question to The Clay-Worker, but it is a practical one, and is evidently more than one-sided, since we see furnaces inside the kiln walls on some yards and outside on others. Furnaces entirely outside of the kiln were almost universal some years ago, but now we find most new kilns with furnaces wholly or partially in the kiln walls. Hence the tendency seems towards the inside furnaces. This does not mean, however, that any system is to become universal. For many years boilers have been built that have their furnaces inside the shell of the boiler and entirely surrounded by water, and though the practice has much to commend it, yet it does not seem to gain headway over the externally fired boiler. A short time ago I had a letter from a brick company in the Transvaal upon this point, stating, "We notice that in the States brick kilns are almost invariably constructed with outside fire holes or furnaces, whereas, in this country and in Great Britain the fire holes are usually built into the side of the kiln. Will you kindly inform me what is the advantage claimed for the former system." The first down-draft kilns I ever used had the furnaces entirely outside of the walls of the kiln, with grate bars four feet long. A single arch, 4½ inches thick, over the furnace had the top exposed to the air. We were making face brick and it was thought that the outside furnaces, being farther from the brick, gave better protection against overburning of the top and discoloration of the brick. No doubt these dangers were avoided by the outside furnaces, but it has since been proven that a properly constructed furnace extending at least through to the inside of the kiln wall will, if properly managed, give equally good results. If the furnaces are built outside of the wall, or partially so, that part of the arch exposed should be double, with an air space between, and the upper arch covered with sand. The side walls of the furnaces should be built with not less than 13 inches of brick work with an air space back of the fire brick lining of not less than two inches.

The latter part of the question can be answered affirmatively in most cases, if it is understood that the furnaces are not to be placed near the brick in a down-draft kiln by raising the furnaces as near to the spring of the arch as possible. It is a common mistake to get the floor of the brick factory too low, so that the kiln floor must be near to the ground and the furnaces in a pit or elevated too high for best results. In no case should the grate bars be above the kiln floor and in most kilns they should be 12 to 18 inches below this level. The object of having the fires near the level of the exit of the gases from the kiln is so as to insure a strong draft and a hot bottom, thus saving time in burning and getting more hard brick.

Written for The Clay-Worker.

THEORY OF DRAFT AND CHIMNEYS.—No. 3.

By Theo Rizer.

STABILITY.

IN THE PRECEDING ARTICLE it was shown how the height and area of chimneys may be determined for various rates and quantities of combustion; and it may be well, before proceeding to treat of any constructive details, to turn our attention to some points affecting the stability of chimneys.

The principal force tending to destroy the equilibrium of a chimney is the pressure of the wind, and during severe storms many tall chimneys have been overturned. Not only have unsound structures perished, but seemingly well-constructed chimneys have yielded to the violence of the wind.

The center of action of the wind pressure is taken at the center of gravity of the exposed surface, and the total wind pressure is equal to the area of this surface multiplied by the pressure against each unit of area. The moment about the base which this pressure creates is equal to the total pressure multiplied by the distance from the center of action of the wind to the base. The resistance afforded by the chimney to this overturning action is equal to the moment obtained by multiplying the weight of the stack by the distance from the center of its base to the edge around which the chimney tends to tilt or overturn; and, also, to the cohesive strength of the brick work which acts throughout the cross-section of the stack, tending to prevent rupture and the overturning of the portion above the rupture.

If the cohesive strength of brick work were a determinate factor, the stack might be considered a cantilever; i. e., a beam with one end free and the other rigidly fastened, and the resisting moment of its section mathematically determined. However, when the cohesive strength of the brick work is considered at all, conservative practice assumes a unit value for bricks laid in lime mortar of 7 to 10 lbs. per square inch; and in making calculations for the resistance of stacks only one-half the stack section is regarded effective in resisting the overturning moment of the wind as shown by the shaded portion of Fig. 7. The resisting moment of this cohesive strength is equal to the product of the area of the half section multiplied by the cohesive strength per unit of area and the distance from the center of gravity, C; of the half section to the edge around which the stack tends to overturn. This is shown graphically in the figure. In ordinary chimney design, however, the resistance due to the cohesive strength of the brick work is not usually taken into consideration, the chimney being built sufficiently heavy to afford the necessary stability.

From table 5, we find that the pressure of the wind moving at the rate of 65 miles per hour, or 95 feet per second, in great storms is nearly 22 pounds per square foot, while it is on record that a pressure of 80 lbs. per square foot, corresponding to a velocity of 142 miles per hour, has been measured during gusts of wind in the more violent storms. These excessive pressures are, however, only of momentary duration, and are usually neglected in calculating the stability of chimneys, since it is considered that the inertia of the chimney will afford sufficient resistance to the overturning tendency of these pulsations. In the best practice, an overturning force due to a horizontal wind pressure of 56 lbs. per square foot is assumed, which provides a considerable margin of safety in the highest winds of any consequence, as will be seen from Table V.

TABLE V.

Showing Velocity and Pressure of Wind.

Description.	Miles per hour.	Feet per second.	Pounds per square foot.
Gentle breeze.	4	5.86	0.078
Sharp breeze	6	8.79	0.182
Pleasant wind	12	17.58	0.729
Brisk wind	20	29.32	2.031
High wind	32	46.92	5.208
Very high wind.	42	61.57	8.978
Storm	50	73.30	12.707
Great storm	65	95.29	21.472

The first factor, then, in designing a chimney for stability is to ascertain the overturning moment of the wind due to a maximum pressure of 56 lbs. per square foot. Taking the sketch in Fig. 8 as the side of a square stack 120 feet in height, 12 feet across the base, and 9½ feet square at the top, the area of the surface exposed to the wind pressure is $120 \times \frac{12+9\frac{1}{2}}{2} = 1{,}290$ square feet, and the total horizontal wind pressure is $1{,}290 \times 56 = 72{,}240$ lbs. The overturning moment; that is, the force with which the wind tends to rotate the chimney about its base is the product of the total wind pressure by the distance from the center of action to the base. The center of action of the wind is taken along a horizontal line passing through the center of gravity of the exposed stack surface, as shown at x y in Fig. 8. This line may be located with a fair degree of accuracy by cutting out an accurate scale diagram on cardboard of the chimney surface exposed to the action of the wind and balancing it on a knife edge. The position of the knife edge will then coincide with the line representing the center of action of the wind.

Another and more accurate method of locating this line is by the system of analysis usually employed by first-class chimney designers. As this process is rather too complex to be understood by the majority of those unaccustomed to mathematical analysis, space will not be consumed at this time in a detailed explanation. Moreover, the writer considers it an unnecessary refinement with the comparatively low chimney heights used in common brick yard

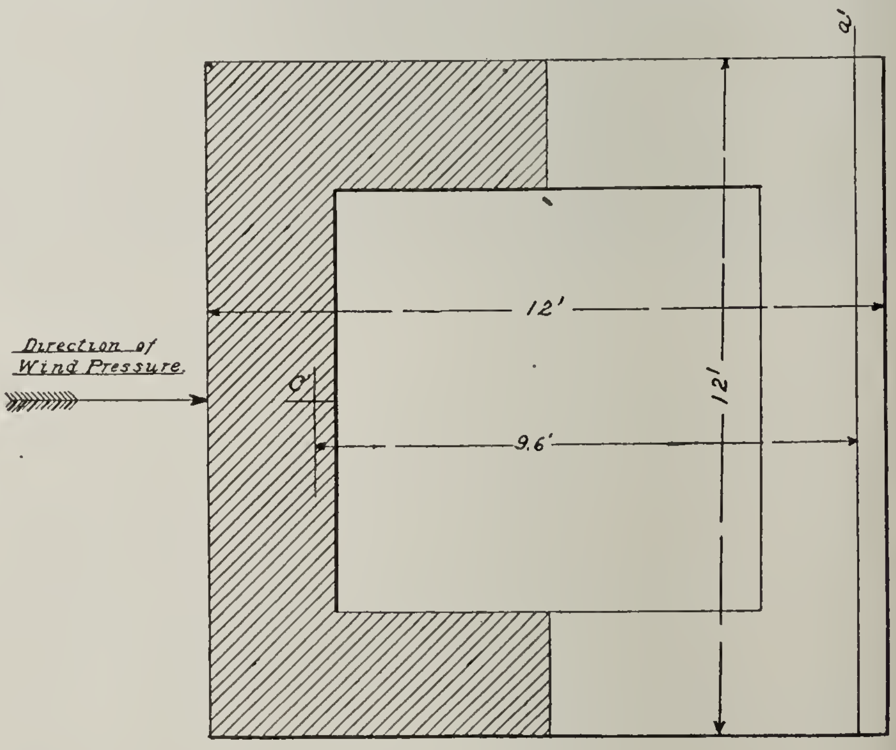


Fig. 7

practice. By the method previously mentioned of balancing a piece of cardboard cut to scale to represent the surface of the stack exposed to the wind pressure, the line x y in Fig. 8 was found to be a little more than 56 feet from the base; whence the overturning moment of the wind in this case is 72,240 × 56 = 4,045,440 foot pounds. To resist this overturning moment is opposed the weight of the stack, multiplied by the distance in feet from the center of the base to the edge around which the chimney tends to overturn. In the plan of the base shown in Fig. 9, it is assumed the stack would tend to turn about the line a a′, since it is obvious that the brick and mortar along the extreme edge would crush under the weight of the tilting stack. Assuming that the distance from the line a a′ to the center of the base is b feet and the weight of the chimney is W pounds, then the stability of the chimney is W b foot pounds. This, for permanent stability, must be equal to the overturning moment of the greatest wind pressure; and in the chimney under consideration since b is taken at 5.5 feet, $W = \frac{4,045,440}{5.5} = 735,535$ pounds. Taking the weight of brick work at 125 lbs. per cubic foot, this would require an average thickness of brick work of about 16 inches.

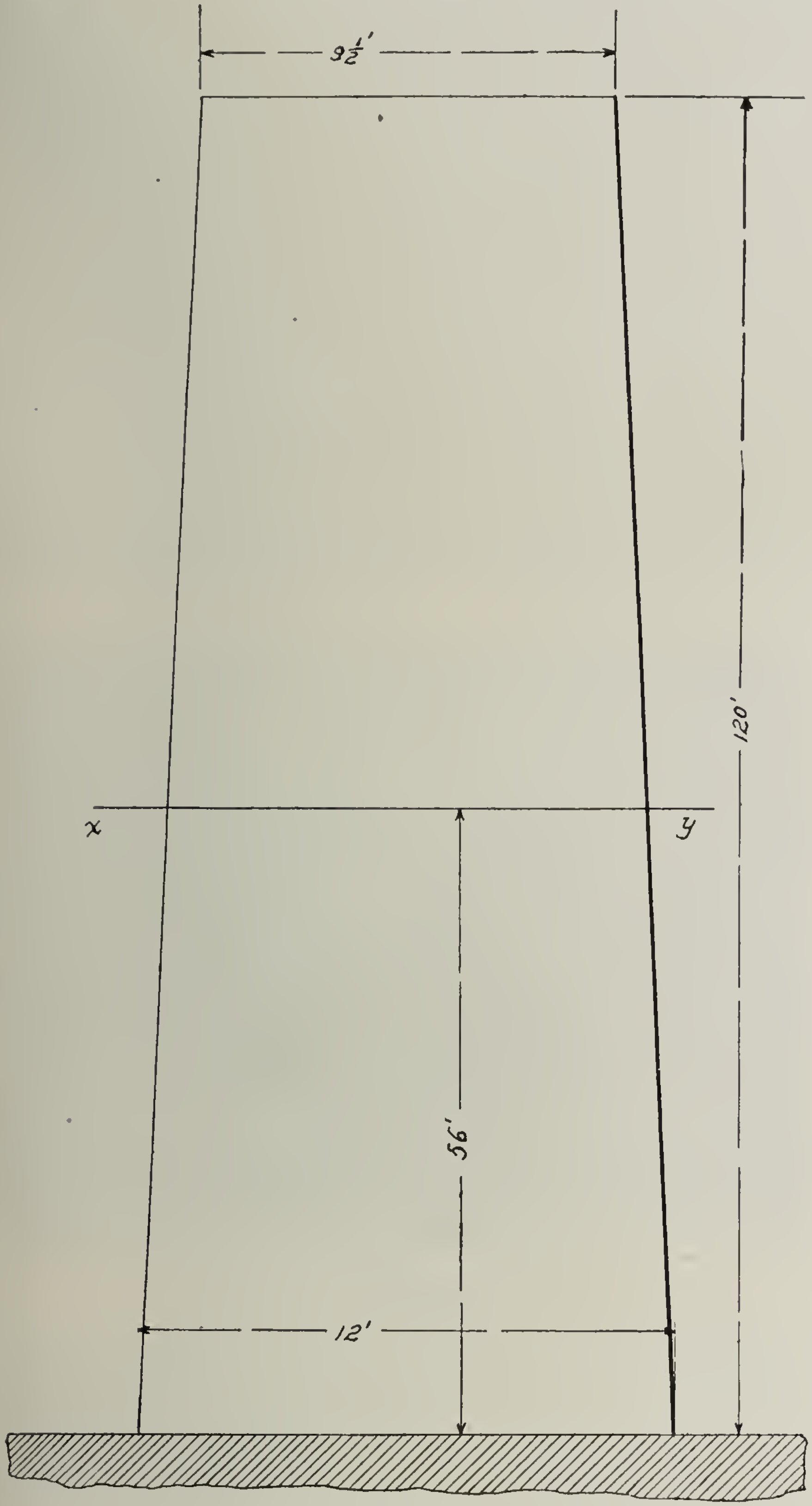


Fig 8

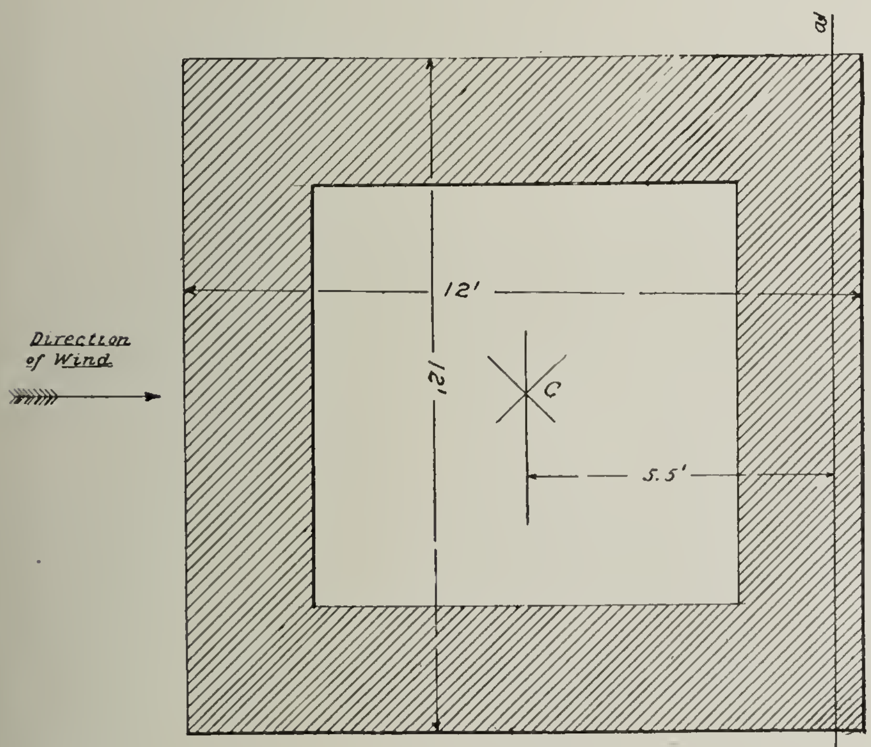


Fig. 9

The equation usually employed in obtaining the necessary weight of a stack is $W = P \frac{h^2 d}{b}$, in which

W = weight of stack in pounds,
h^2 = square of height in feet,
d = mean width of stack, in feet,
b = breadth of base, in feet,
P = wind pressure in lbs. per square foot = 56 lbs. for square, 35 lbs. for octagonal, and 28 lbs. for round chimneys.

This equation is simply a deduction or formulation of the principles previously given, with the exception that the center of wind effort was taken at one-half the height of the stack, and the area of the exposed surface as the product of the mean width of the stack by the height, a = hd. These assumptions are, of course, more or less erroneous, depending on the shape of the stack, but are close enough for brickyard purposes. In case of an existing chimney, the force necessary to overturn it may be obtained from the formula $P = \frac{Wb}{h^2 d}$, where the letters have the same meaning as before.

[TO BE CONTINUED.]

HOPE FOR HOLDERS OF BLACKENED OR CHARRED PAPER.

Experience at Chicago and Boston Fires Proved That Documents May Be Restored.

One of the most interested spectators in the ruins yesterday was Prof. C. Gilbert Wheeler, a chemist and geologist of Chicago. Mr. Wheeler lived in Chicago during its great fire, and in Boston during the reconstruction period that followed the fire there. These experiences made Professor Wheeler's talk of unusual interest.

"Your fire differed greatly from the Chicago fire," said Professor Wheeler. "Two hundred people were killed at Chicago, many residences were destroyed and there was much looting. You were saved all such horrors here, as I understand the loss to residences was comparatively slight and that there was little looting. In Chicago thieves were rampant, and your police department and military service here deserve high praise for preventing such a condition here.

"The experience here, as in Boston and Chicago, proves that brick is the best fire-proof material, and that vaults of thick brick walls, with double doors and air spaces, are the best protection against fire for books and valuable papers. The idea that papers and money blackened by the fire are of no use is wrong, as chemical treatment will often result in bringing to plain sight money and paper that seem blackened beyond recognition. The United States will redeem money if certain portions are legible, and many bonds have a similar status. No one should throw away his valuables, no matter how black or charred, until they can be given careful examination by a chemist.—*Exchange*.

If you want experienced help, read the "Want" ads. in THE CLAY-WORKER.

Written for The Clay-Worker.

BRICK YARD DOINGS IN PHILADELPHIA.

THE LOCAL ENVIRONMENT is clear of all those insinuating but pessimistic producing qualities, such as strikes, coal famine and frosts. Consequently the average brick man looks forward to a good season. Out near Darby, the little steadfast plant, established some thirty to thirty-five years by Thomas H. Gessner & Sons, still works merrily on, despite the fact that all but his 7½ acres is built up, and surrounded by thousands of two and three-story dwelling houses; the product of the alert and ever ready real estate operator during the past ten or twelve years. This has been made imperative by the establishment of the J. G. Brill Car Construction Company being there located and giving constant employment to thousands of first-class mechanics. The Gessners have done away with their hand gangs and rely now solely upon their Penfield machine, which has served them nobly ever since its installation in 1889. From it they obtain their 27,000 daily, and when their output runs into the three million, the season is called at an end, and the machine is closed down and is housed for the winter.

Three 10-arch kilns, having a capacity of 190,000 each, do the burning, and for the drying the natural means still prevails, with the aid of the racks. The clay bank yields sufficient yet from the five-foot depth, and there reveals sufficient for another four or five years.

They usually start up in the middle of April and shut down about the end of October.

The prices obtained here are: For common hard $8.50, ordinary hard $9, select $10.

Over in Kensington and the Nicetown branch, Joseph Siners Sons, two of the strenuous examples of the brick yard craft, were busy firing up inside and outside: Firing up kiln No. 3, firing up stove No. 1, for the stimulating coffee pot and the mid-day meal.

After a good season all through 1903 in which they put out over seven million, they closed down for repairs in January, doing odd chores and short haulings until along in the second week of March; from this time on they have been busy, with future prospects looking bright and strong. Real estate operations all through Nicetown, Frankford, Kensington, Olney and even Holmesburg call upon this and Alex. McAvoy's yard, consequently they obtain the cream of that northeast section trade, untrameled by any rival yard. Many of the large textile plants, taking advantage of the cheaper ground and lighter taxes, have, and are making arrangements to locate out there, and if there is any class of trade to which catering is easy, it is the absorbing quality of a good straight wall, running 206x186 and four to five stories high, and the two and three-story dwellings, given out in lots of 50, 75 and 120, each absorbing bricks to the tune of 25,000 to 35,000 each.

The Siners have a number of these contracts on hand and for the next four or five months the haulings will be made as seen in our illustration No. 1. The three-horse team takes out 1,500 at a time and the Siners have pressed these into their service, knowing the wisdom of such things. No. 2, the welcome moment is that period when the horse gets down to his oats as we get down to ours, the question of absolute satisfaction derived, must be settled between man and beast later on.

The present call is for a large supply of salmon; they are bringing $6. Hard also has the next, straight hard $10; stretcher $11.

By the way I hear that A. G. Collom, who suffered from the disastrous fire last month, thinks seriously of quitting altogether. His present lease expires in a year and a half, and it would seem rather inconsistent to rebuild for such a short time. Over the 'phone yesterday he said, "He was unable to find a suitable location, and about decided he would quit." Collom is a good brick maker and as a man is well liked all around. A consistent boss and it does seem a pity for a good man to drop out. He has the grist, all he needs is the clay.

Out at 58th and Walnut streets, William Conway could be seen out on the second story veranda of the main office, performing the functions of the social M. C. between his calfskin No. 7's and the shoe brush. You never saw him untidy, neither have I. After ploughing across a forty-acre field, ripe and juicy from the early morning storm, and the sun at 90, he proffered the brush to me. I sweetly declined, and he thereupon got me something better. Discussing the proposition of the N. B. M. A. to go out to St. Louis, he concurs in its being a good proposition but one he could not touch until the latter part of October.

The yard is busy and the season starting a trifle late, compels the "boys" to-jump around. His output for the last year was eleven and one-half million, and the signs point to this season going another half notch. He has one good call for 300 two and three-story houses, and this means a strong dose of steady applications before they get through. Another contract calls for the addition to the Arcade Building at 15th and Market streets and still another for the new power house to be erected for the Philadelphia Traction Company at 52d and Lancaster avenue. So Mr. Conway feels that for the next month or two the yard will need some close attention. Especially so, as they were held back by a somewhat backward season, it was not until the 10th of April they were able to get started, now everything is working as merrily as a blacksmith's hammer.

Hauling 1,500 Brick at a Load.

On the road down we were joined by Mr. Howard Chambers of Chambers Bros. Again the all important question is flashed, and back came the merry answer, "We are right busy. We are making some good shipments West and South. From the South the indications point to very fair with a strong possibility of a rising temperature."

The next to accept our early greeting was the veteran Thomas B. McAvoy. Seated in his arm chair at the office at Broad and Arch streets, writing and smoking most industriously. "You can say we are busy; up there at Perkiomen everything is moving along smoothly and we have got our share of the business. We are shipping now a repress block, and New York makes the demand. There is a call also for a small vitrified brick, and a vitrified stretcher for sewer bottoms. These are made in common brick size and vitrified for that purpose. So all around we are satisfied and I keep working with the boys." John McAvoy has just returned from St. Louis, looking well and fit for business. He says the exposition is all right, although it is not overburdened with brick yard exhibits.

The Equitable Brick Manufacturing Company, Limited, 60th and Pine street, everything looked as sweet as whitewash, green grass and roses blooming could make it. You may smile at this, but this is the garden yard of Quaker City. As you enter the yard the glance is compelled towards the trim stretcher brick nicely pointed one-story office building, surrounded by as nice a flower garden of roses and honeysuckle as you would wish for around any dwelling house. Down below, the eye notes the care and attention which has been bestowed on the wagon sheds and stables whitewashed to the point of vanity, but it does not lessen the dignity of the plant or its business.

Outside stood Charles Kimball ablaze with good health and humor: "Business is good. We have sold right up for this season, after getting out over fifteen million last year. When they were compelled to go out and buy three million salmon to keep things plumb. They have given up making hand made, honestly believing their stretcher to be better. From the Chambers 'End Cut' we get 65,000 daily without any trouble, and don't have to push it. Oh, we stand by the Chambers machine, its a dandy," and so genial Charles Kimball usually winds up any reference to the plant.

It will thus be seen that there are no signs of any immediate trouble on the horizon line of our local men. A little trouble exists among the stone men and cutters which we believe we will leave for the advisory board of the Master Builders' Exchange to settle. But that is all. W. P. L.

The Noonday Rest at Siner's.

MANY METHODS OF CARRYING MAIL.

A Curious Exhibit in the United States Government Building at the World's Fair.

THE MANY METHODS of carrying the mail in the past and present are shown by the United States Postoffice Departments in the Government Building at the World's Fair The exhibit contains pictures and models and a real Alaska dog sledge used for carrying the mails in the far north. To this sledge are attached a train of Alaskan dogs, mounted and harnessed, looking as natural as if alive. This train doubtless has covered many miles over the bleak and frozen territory in the far north, carrying Uncle Sam's mails. The cowboy mail carrier on his trusty steed, galloping across the plains with his letter pouch, the footman carrying mail through the dense forest, and the mail carrier on snow shoes in the great timber districts of the north, are also shown in this exhibit, and there is a horse sled and an old style buckboard, a reindeer sledge and an Esquimo driver. Coming closer to civilization, the rural mail wagon and city mail wagon, the electric mail car and the postal car, as used on the great railways of the country, are exhibited, giving World's Fair visitors an idea of the magnitude of Uncle Sam's mail carrying business.

Written for THE CLAY-WORKER.

SAND-LIME AND CEMENT BRICK.

Objections That Composition Brick Must Meet and Overcome Before They Can Compete Successfully With Burned Clay Brick.

I WAS MUCH INTERESTED in reading the paper presented at the Cincinnati convention by Mr. De Long, of Glens Falls, upon the above subject, in which he told of his experience in embarking in the manufacture of this new product, and was somewhat surprised that the matter excited so little discussion in the convention.

The activity which is now on along this line is certainly most significant and promises one of two things, either a most serious competition with clay brick or a great disappointment and heavy loss for those who are embarking in it with so much enthusiasm and large investment of money. It may reasonably be said that the opinion of any one man is of little value as to the outcome of this industry, for it is unquestionably to a large degree an experiment. There is only one true test of a "sand-lime" or any other brick, and that is the test of time. The chemical test, the test of freezing and thawing, of heating and cooling or of crushing strength is of little practical value in a product of this kind.

A Reserve Stock at Kensington.

Those of us who have seen a third of a century or more in the study of the manufacture and use of brick have seen several "composition" bricks put upon the market with nearly, if not quite, as much enthusiasm and promise of success as is now shown in the case of the "sand-lime" brick. Some twenty years ago a company, with headquarters, if I remember rightly, in Milwaukee, were putting out such a brick. Two representatives of the company spent several weeks in Boston. They had fine-looking samples which had successfully withstood all the standard tests (except that of time). These men spent hours in my office trying to interest me in the manufacture of these bricks. They asked $20,000 for the "rights" for Massachusetts. They had sold Pennsylvania for $40,000. The Yankees did not "bite worth a cent," and the men returned to the more enterprising West. Thus New England lost its opportunity, and in a few years the new industry was lost in the swamps of failure.

A few years later another "composition" brick appeared, also hailing from the West. It was a beautiful brick, square and straight and sound and produced in all colors. It would withstand all the usual tests. Lay it out on the ground all winter and it would be found in the spring as sound as ever. Sudden heat and cold did not affect it. It would stand a high crushing test. In every way it promised to be as great a success as is now claimed for the "sand-lime" brick. This time the promoters were more successful in interesting Eastern capital. Some of the leading brickmakers were greatly interested and expressed their faith in the new brick. A company was formed and a plant erected at Woonsocket, R. I. The manufacture commenced and the bricks were put upon the market. Like their predecessors, however, they were a failure and after a few years of struggle the enterprise was abandoned.

But even judged by the past almost universal failure, it would not perhaps be fair or reasonable to claim that no "composition" brick of good quality can be produced. In fact, the contrary has been proved. In my own city of Newton, Mass., there are several private residences, built some thirty years ago of cement brick, which are in a fairly good state of preservation to-day. I think the Woonsocket Company put out some bricks which have stood well. But right here is the weakness or fault or danger of all "composition" brick. While some good brick have been produced by some, if not all, of the various processes put forward during the past thirty years, yet the quality of that class of bricks depends so absolutely upon the quality or chemical character of the ingredients, or in the exact proportions to be used, or in the conditions under which they are used, that even a slight variation in these may so change the character of the product that it will be unsafe to use in the erection of buildings.

The danger here is all the greater from the fact that it is impossible to detect this fault in advance by the appearance of the brick, for it is only the test of time which will divulge its weakness. It should, and I think it will be, a serious question with owners and architects whether they should take the risk of erecting their buildings with a brick over which for years there must hang the uncertainty of durability, when there is available at their hands so reliable a building material as burned clay, which has so successfully withstood the test of centuries and which meets in the highest degrees all the requirements of both utility and art.

A material, moreover (and this is important), whose weakness, if any, can be detected before it is put into the wall. A novice even can tell the difference between a hard and a light hard brick, and a mason's apprentice knows enough to put the hard in the face of the wall and to use the light hard for backing.

I note that the advocates of "sand-lime" brick often put the case in this way:

"The 'sand-lime' brick, *if properly made*, will never disintegrate."

A most significant qualification; it is this very qualification, this element of uncertainty, which discounts all "composition" bricks. But it is claimed that "sand-lime" brick have been used with success for many years in Germany and other European countries. This is doubtless true. But do we get the record of the failures? As before remarked, good bricks can and have been made of various compositions, but the *possibility*, if indeed not the *probability*, that some brick of poor quality will be put out, and, owing to the impossibility of detection, will be put into the wall, and will later disintegrate to the dismay and loss of the owner, will give pause to the conservative architect, owner and investor.

But some say there are no chemicals in "sand-lime" brick, which must mean that they are mortar brick; we all know what mortar is. Pull down a brick building from one to two hundred years old, and you will find the mortar harder than the brick itself, *or you may find it disintegrated.* Pull down twenty buildings of different ages, and you will find the mortar is in all stages of preservation. What makes this difference? Various things; a difference in the quality of the sand or the lime, a difference in proportions, careless mixing, varying conditions of the weather, the various uncertainties which ever must attend the preparation of chemical mixtures, and where lime forms one of the principal ingredients the mixture can surely be rightly called a chemical mixture.

Portland cement is one of the most reliable materials of its class, but even in the case of the most carefully prepared brands an occasional failure is scored. The manufacturer claims it is the fault of the manipulator and not of the cement. The manipulator says no; it is the cement, and quite often the question of what caused the failure remains forever a mystery.

I would not do any "infant industry" an injustice. I fully believe in progress, and that one man may succeed where others have failed is proved by the history of progress. A thoroughly reliable "composition" brick may yet be produced.

But there is likely to be "much tribulation" for somebody before that end is attained. I admit that I am an enthusiast on the subject of burned clay as a building material, and perhaps I am sensitively jealous of its rivals. It has stood the test of time, as to strength and durability, beyond any other material. It has figured in the preservation of the most valuable and important works of mankind and has brought down to us from remotest antiquity the most precious treasures of history and art.

"Old Mother Earth" and "The Demon of Fire." Battles royal they wage. Strenuous indeed is the birth of a brick. "Let me at her," roars the red demon, as he rushes through the flues. But he is held in check by the discreet burner, who knows right well that if given rein he will so blacken and twist and warp the little blocks of earth that the "Old Mother" herself would hardly know her children. So he holds the demon in leash, and when he has gone just far enough to put his brand of hardness and color in the face of the brick he chokes him off, and when the kiln is opened the transformation is complete. The blocks of clay have become even more enduring than the rocks and the hills, and behold their beauty. A great artist is fire, and the touch of his hand has given to the brick a coloring which will never fade and the beauty of which will be a joy forever.

And speaking of fading colors, right here is one serious objection to any composition brick. The color must come from the insertion of chemical compounds which will inevitably fade by exposure to the weather. What is more unsightly than a building faced with bricks which have the faded, washed-out appearance of a woman's calico dress which has been laundered some four or five times? In the erection of buildings upon the appearance of which largely depends the market and earning value, and which should be so constructed that they will be a credit to the owner and to the town or city where erected, and that, too, for generations to come, why experiment with an untried material just for the possible saving of a few dollars in first cost and at the risk of a possible cost of an hundred times as much if the experiment proves a failure, when there is at hand so tried and true a material, at a moderate cost, as burned clay products?

Boston, May 10, 1904. GEORGE M. FISKE.

The New York Blower Company's Improvements.

The New York Blower Company thoroughly reorganized, has taken up temporary offices at 25th Place and Stewart Avenue, Chicago. The engineering staff consists of experienced members of the heating and ventilating fraternity and they report that the outlook is bright, and that they are getting their share of orders. They have changed and improved many of their patterns and designs and claim especially to have the best hot blast heater on the market. Their main factory is still located in Bucyrus, O., while they have a complete factory in Chicago to turn out the necessary sheet-iron work, and are thus prepared to manufacture the complete apparatus for heating, ventilating and drying jobs without having to sublet part of it. New catalogues are in the printer's hands, which will be issued to their customers shortly.

For cheap machinery the reader is referred to our "For Sale" columns. We do not advise the purchase of cheap machinery. As a rule, cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted," "For Sale," etc., columns a means of satisfying their needs.

Written for The Clay-Worker.

POTTERY NEWS.

THE POTTERY BUSINESS has been rather slow with most of the potteries throughout this section for the past two months and the last of May and the first part of June or at least so far this month has seen it duller than it has been for some time in the past. A few of the plants have a fair number of orders upon their books, but the majority of them are running very slack.

The Globe Pottery of the East Liverpool Potteries Company, of East Liverpool, Ohio, has been shut down until after July 4th, when they will start up in full again. They are installing the sprinkler system of fire protection during the shut-down.

An addition is being built to the Harker Pottery Company of East Liverpool, Ohio, to replace the old wooden buildings now being used as a decorating shop, which will be torn down as soon as the new ones are well under way. They will also erect a new pair of decorating kilns.

The Murphy Pottery, formerly owned by the George C. Murphy Pottery Company and which was destroyed by fire some weeks since, is now being wrecked and the ground being cleared. The ground will be used for other purposes likely and the plant will not be rebuilt at least not at present. Mr. Murphy, Mr. A. E. Massey and Mr. Jno. Horwell, the former proprietors of the plant, have taken charge of the Barberton Pottery Company of Barberton, Ohio, which concern they will manage.

The Hall China Company of East Liverpool, Ohio, is installing some new machinery in their sagger department which will increase their facilities along that line greatly.

The Electric Porcelain Company of East Liverpool, is also installing some new machinery in their clay making department which will increase their capacity in that department.

The Pope-Gosser China Company of Coshocton, Ohio, is erecting a new kiln at their works in that city which will increase their capacity from four to five kilns. They report a fair run of business and are producing a pretty good article of ware. The company is one of the newer institutions.

The Cameron Pottery Compmany of Cameron, W. Va., has been placed in the hands of a receiver. The receiver is the former superintendent of the plant, Chas. Macauley. Mr. Macauley will remain as superintendent also. The Augusta Pottery Company at Mannington, W. Va., which is practically the same concern, is about in the same boat.

Ransbottom Brothers are about to erect three or more new kilns to their pottery plant at Roseville, Ohio. They make a line of cuspidores, flower pots, etc. L. E. Dodds who operates a stoneware pottery at the same place, is about to erect an additional kiln.

The Cambridge Art Pottery Company of Cambridge, Ohio, is installing some new machinery in their slip house, which will increase their facilities in that department. They are at present selling an immense quantity of their "Guernsey" cooking ware.

The Crown Potteries Company of Evansville, Ind., is erecting a new set of decorating kilns at their pottery in that city which will be ready for use shortly.

The new works of the Continental China Company of East Palestine, Ohio, have been started up at last after several delays and are now running steadily. The plant is entirely completed with the exception of the decorating kilns which are now being erected and which are nearly completed.

The Lyons Stoneware Company's factory of Lyons, N. Y., is now running again after the installation of an entirely new pottery outfit so far as the mechanical installation is concerned. The pottery had, up to this time, been operated by hand.

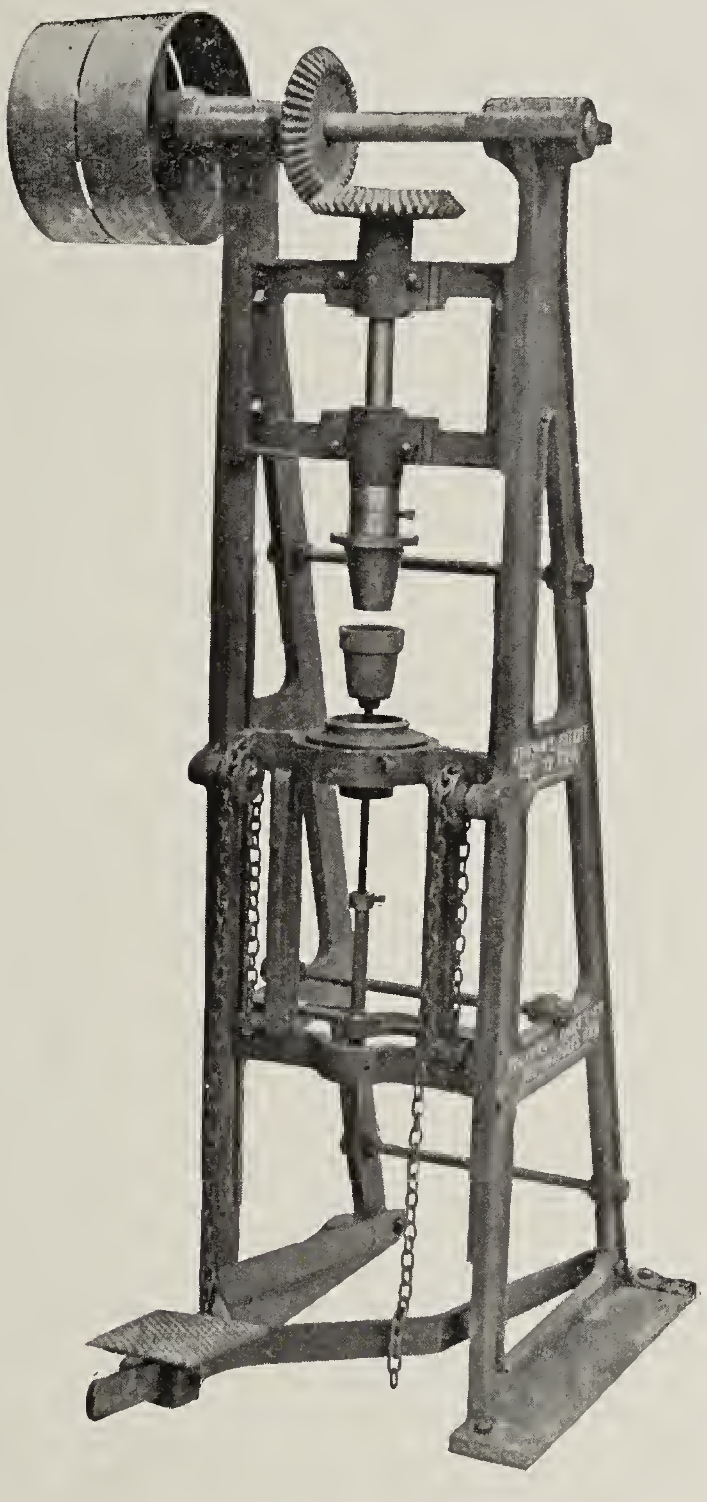
An additional kiln is now in course of erection at the Ohio Pottery Company's plant at Zanesville, Ohio. They have also just completed a large addition to same and installed almost an entirely new outfit of machinery.

C. W. Bird, proprietor of a clay door knob works at Trenton, N. J., has filed a petition in bankruptcy. Liabilities $1,615.04; Assets $394.94.

TOM POTTER.

AN IMPROVED FLOWER POT MACHINE.

We illustrate an improved flower pot machine now offered to the trade by the Rockwood Manufacturing Company of Indianapolis, Ind. The machine is so simple in construction that a description is hardly necessary. It is so easily operated that an inexperienced operator even can turn out perfect pots at a rate that is almost incredible. The machine is equipped with molds for the making of from 2-inch to 7-inch pots. It requires so little power that it can be run by hand where only a small capacity is desired. A single horse-power will drive the machine to its fullest capacity, which ranges from 5,000 2-inch pots per day to 1,500 7-inch pots. Flower pots are in such universal demand, and they are so easily made and burned that they are really a valuable side line for small brick and tile plants. Those of our readers who are interested are requested to write to the Rockwood Manufacturing Company for illustrated pamphlet. The same firm manufactures an improved form of the Old German Clay Grinder. It is all iron and steel and is unexcelled for durability and capacity. Messrs Rockwood will be pleased to give further particulars.



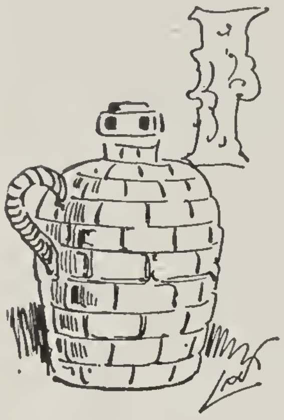
THAT'S WHY IT'S CALLED FIRE WATER.

A German scientist claims that both carbonic acid and alcohol are generated in the human breath, the products of fermentation, and are the forces which make the human machine go. An excess of alcohol doubtless deadens the fire, as the progress of the tangle-footed toper would seem to indicate.

Written for THE CLAY-WORKER.

THE CLAYWORKERS OF BORNEO.

Queer Mechanical Aids Used by the Native Islanders.



I TRAVELED through the quaint island of Borneo, which lies just south of the Philippines, not long ago and found many queer and interesting processes of clayworking. The clayworkers of Borneo are more advanced than those of the Japanese Empire and the Philippines, in one respect, in that they employ more mechanical aids in their work. These devices, however, are crude in design and construction. The clayworkers of Borneo do not excel the artistic character of the Japanese clay work, but they make some very neat and attractive designs in pottery, tile work, building devices and the like. The ingredients used for clay products in Borneo include the natural clay and calcined flints. These are ground by separate apparatus, consisting of a rather odd form of pug mill and by the use of the affair represented in the illustration No. 1. This machine is for the crushing and grinding operation by utilizing the heavy, hardwood, swinging hammer-like device marked A. The natives make this block-hammer from a section of hard trunk, and shape is carved as shown. Then a stout shaft of wood is used for the lever B. This lever is swung to the wood pin at the top of the mill frame and then it is only necessary to provide the motion to and fro by means of the wheel C. This wheel is attached to the lever by means of the arm shown and when revolved by the belt, of course imparts the required motion. The power is derived as a rule from traction machines.

The latter may be worked by wind power, animal power, water power or, as in a few instances, steam power. I saw a few cases of man power in which three natives pushed a lever about the circuit, forcing before them the big wood disk for giving motion to the clayworking machine. The clay in process of manipulation in this device is signified D. Other products are similarly worked in same apparatus. The native clayworkers of Borneo are accustomed to make considerable of their product into brick form as in figure 2 and send it to the markets in this raw (unburned) shape. Then the pottery makers rework the brick into required formations. The clayworkers of the island utilize very few tools. They rely chiefly upon the hands for molding purposes. Figure 3 is a very common style of vessel they make. When finished in its crude form it is not very attractive, but often these people transform the vessel into a most attractive piece of household ornament by the fine finish and decorative work. Figure 4 is another common style of Borneo clayworkers' vessel, made with a handle. The handle is usually quite solid and the utensil is very strong. The artistic figures which are sometimes carved on these vessels are really wonderful in design and originality. A section of clay in readiness for transportation is shown in figure 5. The mandrill of wood is inserted to assist in keeping the form intact for special reasons. The clayworkers make forms of pipes for the purpose of carrying water and sewerage.

These pipes are shaped as in figure 6 for curves, with interior bracing. The braces are so shaped that the water passage is not wholly obstructed. It is a poor idea, however, because foreign substances collect at the edges of the braces and choking of the entire passage may arise in time. Figure 7 is a drawing of the system employed for road making, using clay balls for the bed. First the roadbed is excavated to a depth of about twelve inches and a layer of gravel or sand applied. On top of this layer balls of partly hardened clay are placed and sprinkled with petroleum oil. The balls are rolled and more oil scattered thereon. After several series of rollings, poundings and sprinklings, quite a firm bed results, which, when sun-hardened, rides well with all sort of wheeling, and emits little or no dust, because of the oil-saturated character of the material.

CIRCLES OF CLAY BALLS.

One of the strangest sights I witnessed was in a native clayworkers' yard, where the natives were making a so-called putty clay. There are some glutinous pastes or oils, white lead and turpentine made up, and proportions are mixed with the clay. The result is that the clay balls become quite putty-like and sticky. Then the native clayworker strings these clay balls on a continuous line of hemp rope. The sticky nature of the fiber at this point is such that the balls hold together in line and the line or string is run through the wood rolls, G G, figure 8, in the cased affair. Water is then admitted and the string of paste balls F is caused to pass through it in its passage between the rolls. The door leading into the case is at E. After thirty minutes' run the string of balls flattens and rolls, and assumes varied shapes as permitted by the wonderful sponge-like elasticity resulting. These strange worked sponge balls of elastic clay are like molasses candy and can be pulled and compressed at will like candy. The portions are sold in this

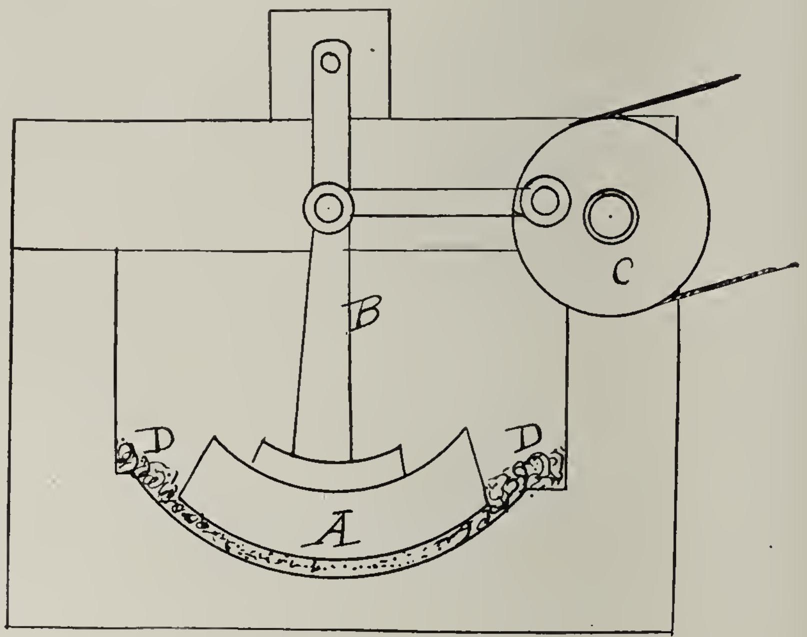
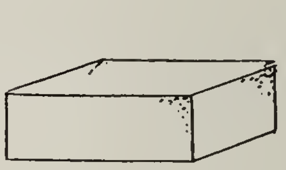


Fig 1



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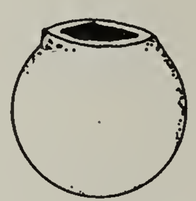

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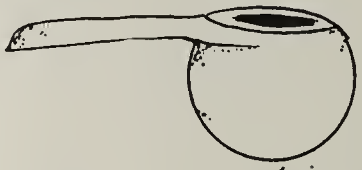

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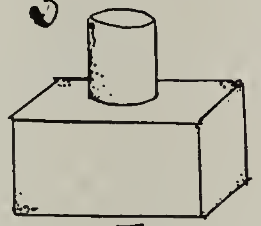

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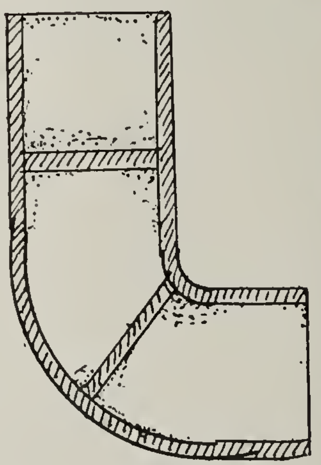

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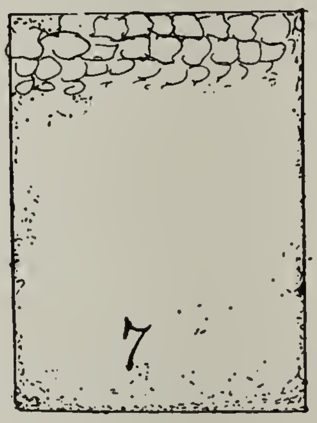


form to the potters and others who make different forms of articles from the same.

TOOTHED PULVERIZER.

The natives employ a toothed pulverizing machine of the pattern shown in figure 9. This consists of a wheel (H) set with points of steel. This wheel is revolved speedily by the belt I. There is another pointed surface as at J, and the material to be ground is fed down in between these scratching points. The points work on the brittle substances and reduce the same to finer particles. After running the material through a number of times a powder-like condition is obtained. The natives have some other forms of interesting devices, but those illustrated are among the principal ones. "A. TRAVELER."

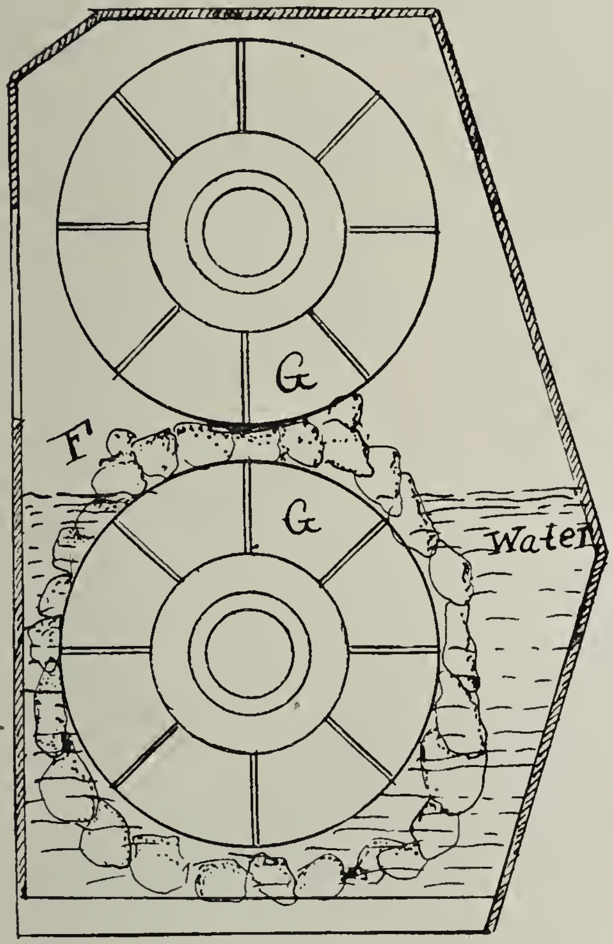


Fig 8

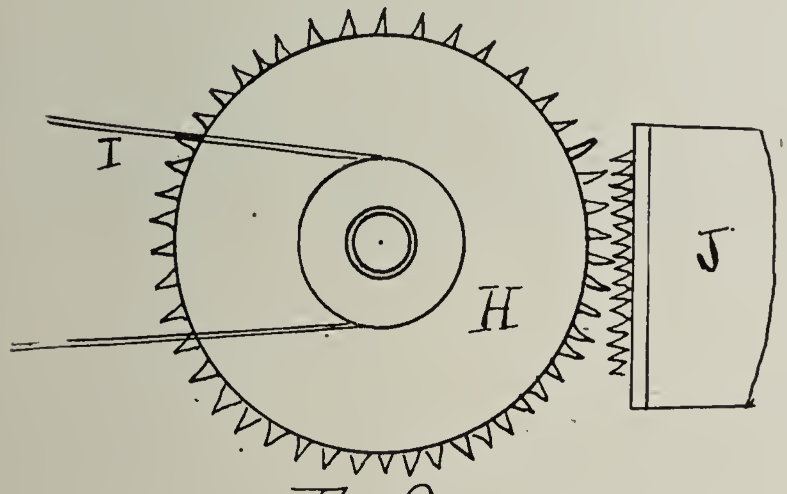


Fig 9

The Harlan Brick and Tile Company has about completed construction work on its new yards at Harlan, Iowa. The old yards there have been made over, and a new yard several times larger than the old has been added. Steel roofs have been placed on all the sheds, and three kilns have been built. Also a house which is occupied by the local manager. The yard will have a capacity of two million brick a year. It is said to be one of the best in the State. Five thousand dollars have been spent in improvements this year.

Written for THE CLAY-WORKER.

THE OUTLOOK—NO. 2.

BY L. C. MOORE.

PERHAPS NO ONE condition adds so much to the sum total of the prosperity of a nation as peace within her borders and peace with all the world. Wars in other lands add much to the demands for the products of our nation, for our surplus is of the kind that goes to the maintenance of soldiers in the field. While we are not of such a mercenary spirit as to desire increased prosperity from the deadly struggles of other peoples, still if they must fight, we are ready, at increased prices, to send them food, clothing, Missouri mules and other deadly engines of war. There is no doubt that the present war in the Far East must be of material benefit to the business of our nation in general, and that every branch of agriculture, commerce and manufacture will get its share of the increased prosperity.

But is there any danger that we may be drawn into the war from the entangling alliances that our growth and expansion have made necessary? We are no longer a Western nation. Both hemispheres claim us as partners in interest, and there is no nation so remote but important commercial matters demand our attention. We as a nation have seen fit to throw out our influence to the uttermost parts of the earth and say to the nations now at war that there must be a bound and limit to their beligerent operations. Thus far our intervention has been well received and seconded by other nations, though the Russian Bear growled quite ominously for a short season. But there is nothing to fear from that quarter at the present writing. We will have no wars of a deadly kind during the year 1904. No other nation is now so secure in her peaceable relations with sister nations. And whatever of wars or rumor of wars there may be in the next twelve months will only add to our prosperity.

Next to peace, financial conditions perhaps hold second position among the many influences that make or mar prosperity. The greater part of our manufacturing interests are conducted on borrowed capital. Most manufacturers are borrowers, and brickmakers are no exception to this rule. Builders are also great borrowers, and cities are perhaps the greatest borrowers of all for the purpose of street paving, sewer construction and other municipal improvements.

Given general good times and plenty of money in circulation—which means low rates of interest and good demand for municipal securities—and the brickmakers and other builders' trades people will find a good demand for their various products.

In the matter of interest the people in the Eastern States have long held great advantage over those who have resided west of the Mississippi river. For many years they have enjoyed rates of interest ranging from 4 per cent. to 6 per cent., while we have been forced to pay from 6 to 10 per cent. During the last five years there has been a great change in this regard. Money matters have seemed so much easier and investors have crowded across the line which divides the East from the West, until there now seems but a trifling difference between the two sections in regard to interest. Real estate—that basis of all wealth—has advanced in price by leaps and bounds; rents have risen in like proportion, and demands for materials for repairing, improving and building have kept pace with all this, creating a business activity in these lines never known before. When interest is low the lender gets but small returns from his notes and securities. He seeks investments in real estate as more profitable, hence the great demand for real estate and the consequent advance in prices. From these causes, too, rents have risen, until renters, in self-protection, have become borrowers of money with which to build, preferring to pay interest on property of their own to paying the exorbitant rents now prevailing. Hence our cities and smaller towns, even the most insignificant villages, have improved to a wonderful extent and called upon the brickmakers to furnish the materials to do the work.

But some say that we have reached the top. They think we are on the other side of the hill now, and that a general slump in prices may be expected all around. They claim that good times cannot last always, especially such a boom as we have had for two years. They are perhaps right to a certain extent. There is likely to come relaxation after long continued struggle. Not that people become tired,—American people never do that,—but there comes a time when a general adjustment must be made. Interest may have been too low, rents may have been too high, thus unduly stimulating building and other improvements, until there may be more buildings than men to occupy them, and then there must be an evening up. Too much money invested in real estate and municipal securities will make a scarcity of money to lend, so that interest will rise and real estate will fall. It is all controlled by the law of supply and demand.

There is no doubt that we are approaching this period of readjustment, but the question that most concerns us is, How near are we there? Do we hold our real estate at too high figures, or would we be safe in adding a few more dollars to our present listing price? Or again, perhaps it would be best to hold our real estate, borrow a few more thousands on it and build upon those vacant lots that are now doing nothing to help pay interest. Money is cheap and easily gotten on our real estate. Why not put those vacant lots in shape to assist in bearing the burdens? Our neighbor just across the street is enjoying a comfortable income from just such property as ours will be after we have completed our buildings. One thing is sure,—either our new property will rent or else our neighbor will have to reduce his rent, as we can afford to take much less than he gets and still have a good per cent. upon our investment. And so this argument will go on and these conclusions will be reached as long as there is a demand for buildings at present rates of rent. How long this will continue is a problem hard to solve—and investors must always take some chances.

In our next paper we will give our reasons for believing that there can be no great falling off in values of real estate, and that the general trend of values will be constantly upward. Of course, there may be temporary declines, but not for any considerable period.

THE PROBLEM OF THE ELEPHANTS.

Successfully Solved by Wise Man Sum Punk—Everybody Satisfied.

When Au Chung, a Chinaman, died it was found that he had left his property by will to his three sons, as follows: One-half to the eldest, one-third to the next, and one-ninth to the youngest son. When the property was inventoried it was found to consist of seventeen elephants. Here was a dilemma, for it was impossible to divide the property according to the terms of the will without chopping up the seventeenth elephant. Finally the heirs applied to a wise lawyer, Sum Punk, for advice, which they promised to act upon. Sum Punk had an elephant of his own. He drove it into the yard with the seventeen and said:

"Now we will suppose that your father left these eighteen elephants. Fum Hum, take your half and depart."

So Fum Hum took nine elephants and went his way.

"Now Nu Pin," said the wise man, "take your third and depart also."

So Nu Pin took six elephants and went.

"Now, Ding Bat," said the wise man, "take your ninth and begone."

So Ding Bat took two elephants and disappeared.

Then the lawyer took his own elephant and went home again, feeling very well satisfied with himself.—*Cassell's Journal.*

BRICK vs. ASPHALT PAVEMENT.

Topeka's Experience with Both Kinds of Pavements—Heavy Expense Necessary for Asphalt Maintenance—Brick Repairs Amount to Nothing.

By P. A. Lovewell.

TO THE smaller city, which, as a rule, sails pretty close to the limit of its financial resources, the question of replacing wornout pavement is one of the most perplexing. If the pavement is not replaced, and the city takes any pride in the appearance of its streets, it requires a very large and rapidly increasing expenditure for repairs which is noxious to the general taxpayer. If it is replaced with new pavement, the law in most States places the burden on the abutting property, the owners of which are loth to assume such a burden as long as it is possible to put off the responsibility for maintenance.

Topeka, Kansas, a city of 40,000 population, is face to face with such a situation. In 1887 and 1888, Topeka laid 194,000 square yards of asphalt on about seven miles of its main thoroughfares. The larger portion of this is rapidly going to pieces, in spite of the expenditure of $54,000 for repairs since the expiration of the five-year guarantee. In 1902 the repair bill was $5,200, in 1903 $7,500, and for economy's sake only the worst holes were repaired in each of these years. To put the pavements in a fair state at the present time would cost $20,000 and as much more as could be spared. The pavement was laid by the Barber Asphalt Company, and all the repairs have been made by the same concern.

As originally laid, the pavement gave good service, but where the trust has tried its hand at patching, the results have been uniformly unsatisfactory, whether done with surface heaters, or by cutting out the rotten places and replacing with new asphalt. In some instances patches put down by the trust have gone to pieces within a few months. Topeka is thoroughly dissatisfied with trust methods, and is looking for a way to escape. Many of the city officials believe that the only escape from the dilemma lies in the immediate cessation of all dealing with the asphalt trust and the resurfacing of all the asphalt paved streets with some other material.

REPAIRING WITH PULVERIZED STONE.

In line with this policy the city is now repairing the worst holes in the pavement with pulverized limestone. It has been found that by the action of water and wagon wheels, the limestone soon becomes almost as solid as cement, retains its place in the cavity and makes, on the whole, a very satisfactory and inexpensive temporary repair. Although not as smooth as an asphalt patch, it seems to endure as well as most of the patching which the trust has done in the city.

Mayor W. S. Bergundthal says, in speaking of the situation, "Being one of the first extensive users of asphalt in the country, Topeka is slow to repudiate this form of pavement which possesses so many excellent qualities. Our people rebel at the idea of giving up the asphalt pavement, but the sentiment is strong that the city cannot afford to pay out so much money for the class of repair work which has been done here.

"On several of our main streets the asphalt has become reduced to shreds and patches. I doubt the wisdom of further repairs under our contract with the Barber Company. We have no special fines devoted to pavement repairs, and whatever work we do in that line must be paid out of the general fund, at the expense of the other departmnets of the city administration. When the time comes for a complete renewal of our asphalt pavements, it will rest with the property owners to decide what material they will have substituted for asphalt."

City Engineer James F. McCabe says: "Most of our asphalt streets are in a deplorable condition. In my judgment, the city should either appropriate sufficient money to put the asphalt in good condition, or else abandon it and afterwards resurface with some other material.

BRICK THE CHEAPEST SUBSTITUTE.

If it comes to a question of resurfacing with some other material besides asphalt, Topeka will naturally turn to brick. There are already 22 miles of brick pavements in the city, with 45 blocks more under construction. Some of it has been down for 13 years, and nothing has ever been spent for repairs. Topeka makes its brick at home, has an inexhaustible supply of sand within the city limits, and lays two courses of brick on sand foundation for from $1.13 to $1.20 per square yard.

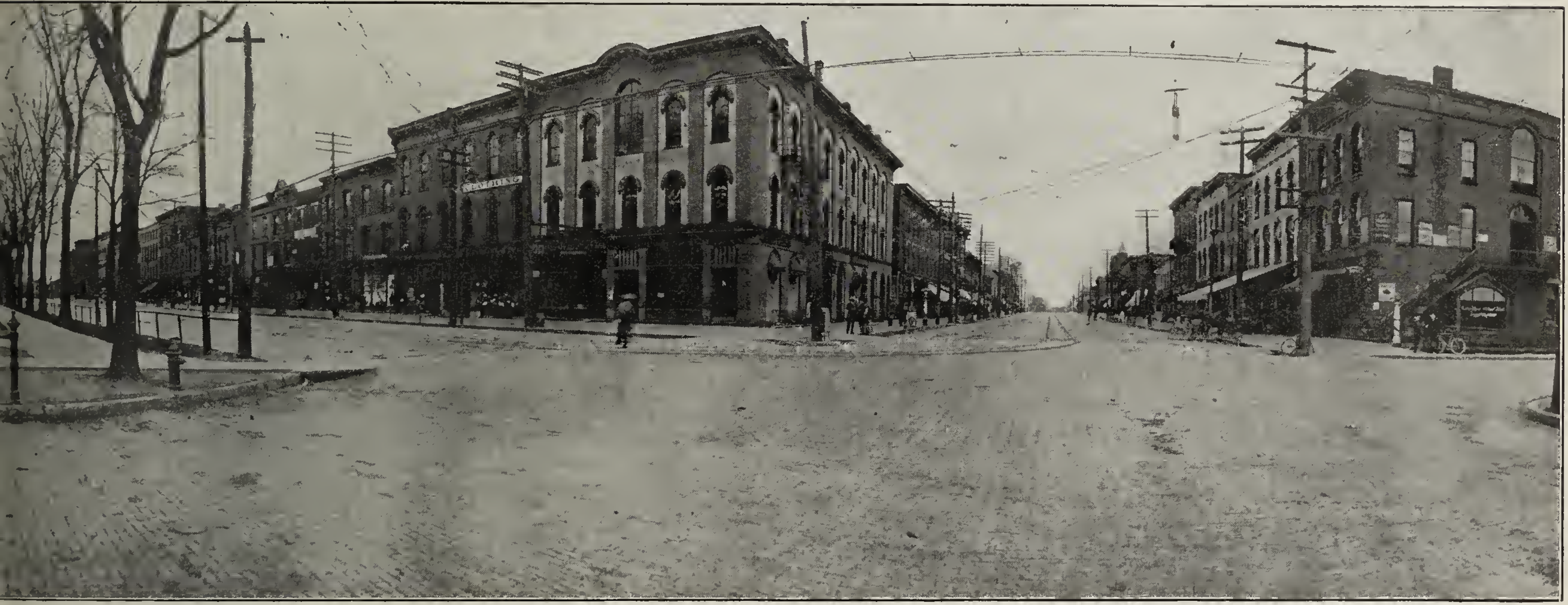
To remove the asphalt surface from the wornout pavement and replace it with one course of brick on the old concrete foundation, would be comparatively inexpensive, though it might present some engineering difficulties. One course of brick on a thin cushion of sand would be about two inches thicker than the existing asphalt surface. In order that the top of the pavement might not come too close to the top of the curb, it would be necessary to cut out part of the concrete in the gutters, giving more crown to the street. As all the asphalt pavements in the city are from sixty to ninety feet wide, this would not be a serious inconvenience.

Topeka has, therefore, to some extent mapped out for itself a way of escape from the asphalt trust. While it may later be decided to resurface the streets with asphalt and not brick, it can be safely asserted that it will be some form of asphalt that the trust does not control."

BRICK PAVED STREETS BEST.

Because They Are the Most Durable and the Most Satisfactory.

FOR REASONS so plain, that he who runs may read, it is pretty generally conceded by all who are informed in such matters that brick pavements are best for small or moderate sized cities. Vitrified brick are not affected by the elements. They neither melt under extreme heat, as does asphalt, nor do they decay if subjected to constant wetting, as do wood pavements. Paving brick are everlasting so far as heat, cold and moisture are concerned and so when a street in an ordinary town or city is once paved with good brick it is good for a generation, at least, if left undisturbed, for there is not enough wear from ordinary travel in such towns to make an impression on a well laid brick roadway. This exemption from repair bills makes a brick pavement very attractive to taxpayers and besides a good brick street has all the advantages of smoothness that is afforded by any pavement, and is far superior in point of cleanliness.



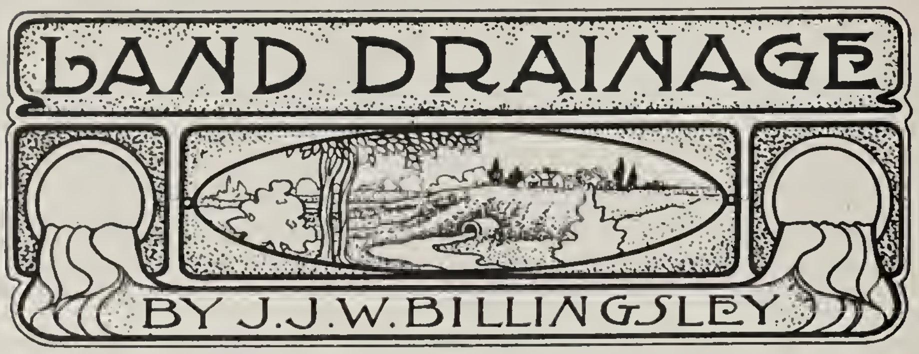
A Recent Photograph of Main and Market Streets, Warren, Ohio. In Use Twelve Years Without Repairs.

When sanitary conditions are considered, there is no paving material that can compare with vitrified brick and certainly no other paving will stand the abuse without injury that brick will. In view of all this is it little wonder that the thrifty county seats in Northern Ohio have without exception almost, begun the permanent improvement of their principal streets, by paving them with brick. The accompanying illustration, for which we are indebted to City Engineer E. M. Milligan, shows how well Warren, Ohio, the prosperous county seat of Trumbull county, in the northeastern corner of Ohio, is paving her principal thoroughfares. The streets pictured were among the first to be improved. They were paved some twelve years ago, and while subject to as much traffic as the principal streets of any city of ten thousand people, the pavements are still good and can be reasonably expected to last, without repair, for another decade.

The streets shown were laid on concrete foundation, the one to the right having a tar filler for the joints and the one to the left cement filler. One of the cement filled pavements gave some trouble on account of expansion, after which for a while a sand filler was used. Last summer they adopted the N. B. M. A. specifications, used a cement filler and provided for expansion joints, which will prevent further trouble from that source and insures a well nigh perfect pavement.

During late years the use of concrete for foundation has been abandoned and furnace slag has been substituted therefor. This is rolled with a fifteen-ton roller, is cheaper than concrete and has proved very satisfactory.

Previous to the use of brick, as a road surface, a number of the city's streets were paved with native stone. In that way they kept the traffic out of the mud, but the pavement was rough and noisy and very difficult to keep clean. Finally something better was demanded, brick was adopted and time has shown the wisdom of the choice, for as Engineer Milligan well says, "With good brick, properly put in place, nothing better can be had for the money."



LAND DRAINAGE

BY J. J. W. BILLINGSLEY.

IOWA'S DRAINAGE LAW.

AT THE last session of the Iowa Legislature much time and labor was spent in amending and perfecting the drainage law of the State. We give in brief the following provisions of the law:

The supervisors have power to establish drainage districts, to build levees and construct ditches, to straighten or change any natural water course when the same shall be for public benefit or conducive to the public health, and the drainage of surface water from agricultural lands. It provides that petition of the owners of land benefited must be filed with the county auditor showing that the lands described are subject to overflow and that the removal of the water is necessary and will benefit the land.

Bond must be given providing for the cost of viewing if the report is unfavorable and the ditch is not constructed.

When the petition is filed the Board of Supervisors shall appoint a civil engineer to survey and locate the improvements necessary and file a plat and profile of all the lands affected or benefited by the proposed system of drainage, together with the names of all owners thereof.

The owners of the land are then to be served with notice of the filing of the petition and survey of the drains and a general notice shall be published in the newspapers. Claims for damages, if any, must then be filed with the supervisors, and in case the drain is ordered appraisers are to be appointed to determine the damages.

Appeal to the courts may follow, but when the amount is determined, payment must be made by the owners benefited. The supervisors shall appoint an engineer to superintend the construction of the drainage system. A board of three commissioners, one of whom shall be a civil engineer, is to be appointed by the supervisors to locate and classify the lands benefited, and said commissioners shall assess the amount of the cost of improvement to be paid by each, which said apportionment shall remain the basis for any subsequent expense for repairs or maintenance. Hearings for amendments or approval of report may be had before the supervisors.

Benefits conferred only by the actual construction of the drainage system as a means of outlet for the drainage of said lands shall be considered in making the apportionment of cost to be paid, and the cost shall be levied as a tax on all lands affected and benefited and collected the same as other taxes for county purposes. The moneys so collected shall be kept in a separate fund and paid out only for purposes connected with such improvement.

Provision is made for the crossing of right of way of any railroad and the assessment of damages, and also for the railroad company's paying its fair share of the cost of improvement.

Provision is also made for the repairs of lateral drains, right to use ditch by other property owners, for the enlargement or diminution, for the establishment of sub-ditches and for other contingencies.

Assessment of the cost is to be made at one time and payment made through the usual channels and the issue of improvement certificates is provided for, as is also the levying of tax in more than one year and for construction in installments; and it is also provided that joint action may be taken by the supervisors of more than one county if it is desired to establish a drainage district for the drainage of land in more than one county.

It is especially provided that the act shall be liberally construed to promote the drainage and reclamation of wet overflow or agricultural lands, and various safeguards are thrown around the proceedings to the end that mere technicalities may not delay the construction of the improvements. From the reading of the law it seems apparent that the makers have carefully provided for the drainage of agricultural lands, requiring it to enable the supervisors to tax the costs against the lands benefited, and to render such action as free from attack as possible.

Laying Tile.

First, one should have a good grade of tile—straight and well burned. The man to do the work should be able and expert enough to move from twenty to twenty-five cubic yards of earth per day and remove only the earth necessary to make the ditch complete for laying the tile.

The first requisite in the work is a good and sufficient outlet—deep enough to secure sufficient grade, which may be as small as one inch to the 100 feet. The grade or fall should be regular to secure a regular inclination. Great care should be taken to make the bottom of the ditch smooth, securing the grade as perfectly as possible. The laying of the tile may begin at the outlet. A double length is preferable to begin with. The outlet should be secured against washing or caving by the use of cobble stones or brick, or a cement wall. In laying the tile, fit the joints closely, turning the tile, if necessary, until they join together evenly, keeping the line of tile straight, comforming to the grade. As the work of laying advances secure each tile firmly in position by shoveling earth to the sides of the tile, firming it enough to hold the tile true to line and grade. Then add more earth on top to cover the tile. The ditch, after the tile are thus laid, may be filled with shovel, or the work may be more expeditiously done with a plow, scraper or grader. Clay is preferable to cover the tile.

Where quick-sand pockets are encountered it is better to bed and cover the tile with clay, particularly the joints. In laying tile see to it that the tile do not shoulder or settle a little to one side and thus make an obstruction to the flow of the water on the inside. An unevenness of the joints, if it is not more than the eighth of an inch, will by so much lessen the capacity of the drain. A little experience and observation will convince anyone that the laying of tile is a most important part of the work—do not entrust it to careless, inexperienced men.

Drainage Laws and Irrigation.

Our drainage laws are defective and, in some cases, stand in the way of advance or improvement. One mean, selfish, ignorant, narrow-minded person owning the land where the outlet ought to be for a large area of land that needs drainage badly can oppose and hold up a whole neighborhood. Besides the need and greed of some lawyers for fees stand very much in the way of improvement. In some cases it costs almost as much to get a small drainage district through the courts as it does to get the ditches through the land. This should not be.

The State or general government has done little to aid in the general reclamation of the wet or swamp lands. Millions of dollars have been spent and millions more will be spent in the irrigation of vast areas of land that is but an experiment at best. Besides, many of these vast irrigation enterprises fostered and supported by the general government are managed and controlled by syndicates of land grabbers. It would be far better to wisely provide for the reclamation of our wet lands and the underdrainage of all agricultural lands that need it, and thus multiply the productions of the country two or three times over, where private enterprise has demonstrated that the expenditure of money and labor will surely be rewarded.

Some large areas of irrigated lands have already been rendered unproductive by the deposit of alkali in the surface soil—lands owned at one time by syndicates and sold at fabulous prices, which are now a drug on the market on account of the alkali deposits, but the work of irrigation goes on largely at the expense of the general government. It may be well to experiment with the arid lands, but we should at least look to the lands that are sure to give satisfactory returns if drained, and provide all needed legislation to advance the work. It is well said that there are thousands of acres of wet and swamp lands in this and adjoining States that could be reclaimed at no great expense for the necessary work—outside of legal obstructions and fighting for an outlet.

Favor Horse-shoe Tile.

We have been much interested in some correspondence in a late number of the Rural New Yorker and make a few excerpts from it, thinking that some of our readers will be interested in the fact that some cling to old methods notwithstanding the length of time that they have been discarded by those who are in the advance guard of up-to-date improvements.

Mr. C. C. H., Monmouth Co., N. J., writes: "While I have not used round vitrified tile for draining wet land, I have had some experience with horse-shoe tile, having recently completed a half-mile drain, and they are doing their work perfectly, as well as others laid years ago. I know of drains that have been laid for forty years or more, and are still doing good work. We use horse-shoe tile from three to six inches in diameter (depending on the amount of water we have to carry), one foot in length. Our tile is laid on boards about an inch wider than the tile on each side, and tiles are covered with marsh hay to keep dirt from working in while the earth is settling around the tile. While water will surely filter through the walls of a porous tile, I do not think it makes so much difference in the amount of water carried where horse-shoe tile are used as it would in the case of round tile, because in the use of the horse-shoe we have a quicker way of getting the water into the drain. We have the joints and the two edges of the tile that lie on the boards. On my farm I would not think of using round tile unless they were laid on boards to insure against settling. In the ditch first referred to there were places so hard we had to use a pick, while in other places it was so soft that a man would sink almost up to his ankles before finishing up. How is it possible to lay a perfect drain on such a bottom, without laying it on boards. I say lay a horse-shoe tile, they will do the work if properly laid, and do it for a long time if properly attended to. They cost less to purchase, and can be laid faster and cheaper."

Another correspondent: "B. H. R. & Bros., Mercer Co., N. J., claims that the water will get into the drain faster," and adds, "we have known tile jointed so close together that the water would lie over them before going through the tile, and when they were replaced with the joints opened a little, there was no trouble. We also know of a case in which the man putting in the tile embedded clay all over the joints and along the sides of the clay next to the board. No water came through the drain until the tile were taken out and replaced without the clay, then there was no trouble. If you want to carry water faster when once in the tile, the round tile will do it better than the horse-shoe, as it has the bottom smooth and the water confined to the lowest part, where the horse-shoe tile has usually the boards rough, creating friction, and the water spreads over more space. * * * We use both kinds, the round for carrying and the horse-shoe for collecting, and if we had only one kind would use the latter in any case."

Horse-shoe Tile a Back Number.

Another correspondent: G. D. of Hunterdon Co., N. J., writes, "The use of horse-shoe tile is about out of date. Any ideas of their superiority over round tile which may still prevail are based upon the erroneous notion that water cannot get into the latter as readily as it ought. Repeated experiences have settled past any doubt that water will find its way into the joints of one-foot tile, no matter how closely they are laid. In fact it is necessary in practice to take some precautions not to have the joints too open. One of the points of the advantage of round tile is, that they are not apt to warp so much in the burning, as the walls are of uniform thickness throughout. If they do come from the factory somewhat out of shape, they can be turned until the joints fit snugly, leaving no opening for silt to get in. Round tile are the only form adapted to the use of collars where these are necessary. As a rule these are not required, the exceptions being in case of the smallest size laid in soft, quicksandy places, or where the freezing of the ground is liable to heave them out of line. Round tile are mostly to be recommended where a perfect water bed is desirable. The amount of water that would have scarcely any current at all in the dirt or board bottom of a horse-shoe tile drain, would cause a small stream in a well-laid round-tile drain, and sufficient to move small particles of sediment which otherwise might accumulate and reduce the capacity of the drain, if not render it entirely worthless. As to the porosity of the tile, it is never a necessity, and is sometimes a detriment. Unglazed tile are generally used on account of cheapness, but they should be well burned so that they may have a clear ring when handled. In fact it is important to have some vitrified tile in drainage operations, to place where the line may come near to the surface, and especially at the last few feet at the outlet."

Another, and as we think an important objection to the use of horse-shoe tile is the fact that the bottoms of earth (if no plank are used) will wear unevenly and in time retard the flow of the water, if not entirely stop the drain; if plank are used they will decay unevenly and in time cause trouble, while in the use of well-burned round tile, well laid, we have a drain that will last and do its work well for a thousand years, so far as we can reasonably judge.

A NEW SAND-LIME PLANT AT COLORADO SPRINGS.

Colorado Springs capitalists have purchased the Colorado rights for the manufacture of brick according to the Huennekes system and already plans are under way for a plant at Colorado Springs.

A company will be incorporated under the laws of the state to be known as the Colorado Artificial Stone and Brick Company. This company will have a paid up capital of $50,000 and nearly this entire amount will be expended on its first plant which will be erected in Colorado Springs in the early spring. Should this venture prove a success other plants will ultimately be started throughout the state.

The organizers have been fortunate in securing the services of Ben Brewer, an experimental brick manufacturer of the state, who will act as superintendent. The officers will be Clark Mellen, president; R. J. Werner, vice president; G. S. Bierbauer, secretary and John Goff, treasurer. In this connection it should be said that Mr. Goff represents the interests of the Newton Lumber Company, which is one of the largest lumber concerns of the West.

About thirty companies have been organized in the United States to manufacture the new brick and of these more than twenty are now in operation. The new method makes it possible to produce brick within twenty-four hours. As is well known to all brick manufacturers the system does away with the use of clay as plain sand is used, with a slight admixture of lime, passed through a compressing machine. The newly-moulded bricks are baked by steam in an hermetically sealed cylinder together with a secret chemical formula. M. S. C.

It has been estimated that for making steam natural gas at 10c per 1,000 feet is as cheap as coal at $1.25 per ton, even though the coal be fed under the boiler by the best types of automatic stokers. For domestic purposes natural gas at 25c per 1,000 feet is considered as valuable as anthracite coal at $5.50 per ton.—*Exchange.*

Written for The Clay-Worker.

THE COLONEL CRITICISES CONCRETE AT THE WORLD'S FAIR.

Things That Deterred a Kentucky Brickmaker from Engaging in the Cement Block Business.

"DO YOU KNOW SIR, I came up here to get convinced that cement is the great and only thing for foundations, steps, sidewalks and a few hundred other things, and now, instead of being convinced I have about changed my mind, so I have," said the Colonel as he seated himself in one of those rustic clay garden seats in the booth of the Laclede Fire Brick Co., at the St. Louis Fair.

"I had been about persuaded that concrete work and cement blocks had the brick industry by the neck, and that about the best thing for me to do was to close up that little brickyard I run in connection with my lumber yard, lay in a stock of cement, buy some cement block machines and get in line with modern progress. In fact, I came here to see the cement display and incidentally determine on what kind of concrete block machines I had better get, for as you know there is quite a confusing array of them, but now I am going back, and I'm going to run that little, old brickyard of mine just as if there never had been a cement or concrete stir in the building world.

"How's that? You want to know why I have changed my mind? Well sir, just come out here with me and I will show you why."

The Colonel led the way toward the Cascades, where there are stained concrete steps and floors, and first he began pointing with his cane at the various cracks and flaws that have developed in the steps, and then we came to a place where a great place in the concrete floor had been patched, and here he stopped and let his wrath pour forth.

"By gad, sir, do you see that patch, and did you notice those cracks and faults in the steps all around us? Well, sir, that is what made me change my mind. Just think of it. Here I have had it dinned into my ears for two summers that concrete is the only and everlasting thing to build with, I have read sermons on the reconstruction of limestone and all other sorts of stone, even had a promoter come along and analyze some of the limestone and clay on my place and paint such glowing pictures about the future of cement that, if it hadn't cost more money than I ever expect to possess to start a cement plant, I would probably have gone into the cement business before now. And then to think that I should come up here to this great Fair to get the final proof of the invincible tread of concrete work, proof that would lead me to abandon my brickyard and find this—find concrete work done here that is having to be repaired when it has not been down over three months. I say, by gad sir, it's a disgrace and from this time on you can talk cement all you please, but you can't wipe out the impression I have obtained right here.

"How's that? Yes I know this is not the cement products' display, or at least it is not the place or product intended for inspection, but it is an exhibition just the same, maybe an involuntary one, but it has made its impression on me, and don't you never doubt but what it will make its impression on others. You may show all the nice things you please over in the cement section, but you've got a show here, and a holy show it is."

"See here, Colonel," I said, "you know that this is not a fair criterion. Just stop and think for a minute of the buildings that are being constructed today entirely of concrete, some fine examples of which can be seen in Cincinnati, big office structures that offer strong enough testimony to any one of what can be done in the way of concrete construction when proper knowledge and care are exercised. This temporary work here was evidently done under the severe stress of rush, and maybe the contractor slighted his work."

"Well, and that's the point exactly. You cement men have preached to me that artificial stone, properly made, is as good as the real article, and here you have artificial steps, stained to imitate red granite, and now sir, I want you to walk over here to the Administration Building and see some real red granite steps. There are no cracks in them, and they have already been standing there a number of years. There is as much difference, sir, as between night and day. Now, wait, I know what you are going to say—that this cement work failed in part because of lack of proper foundation, but just apply that same idea to those granite steps and you'll find the steps intact, foundation or no foundation. And this matter of careless work spoiling concrete is the very tning that has the most weight with me. If just a little carelessness will spoil concrete work, how is a man ever to know till he tries it, and it is too late, that he is getting the right kind of work. Do you suppose I want to lay awake nights in my old days worrying about the probable outcome of a piece of concrete work. Oh no, I'll stick to my brickyard, for I do know what is what when I send out a load of brick. You may excuse and explain the faults in this concrete work work at the Fair any way you please, sir, but it has given it a black eye with me, and you will find others of the same opinion, too. Maybe it wont stop any cement mills, and it wont likely gag any promoters of such enterprises, but it will make many a clayworker feel satisfied with his brick, notwithstanding your display in the cement section. Many of the brick men may be feeling a little jealous of this concrete business, and may be figuring that it is up to them to get in line by dropping out of the clay business and taking up this work, but this will wipe a lot of it out. The only thing I am jealous of right now s such fellows as the Evens & Howard people here that make such a fine lot of clay products that mine looks like thirty cents, but I'll shake that off when I get back home, and the first new kiln I go to build I will order some of those excellent fire brick they make."

And with that the old Colonel stalked away and left me to do some thinking—and I am still thinking, and pass his talk along to the balance of you to think about.

J. Corvus.

THE N. B. M. A. AT THE WORLD'S FAIR.

The Clay Industry Exhibit, Mines and Metallurgy Bldg.

In deference to the expressed wish of a large number of the members of the National Brick Manufacturers' Association, the proposed informal meeting at the St. Louis World's Fair will not be held until the first week in October, though quite a number will gather there the first week in July, as originally planned. For further particulars see editorial in this issue.

An one hundred thousand a day brick plant is to be located at Beacon Hill, Md., where a fine deposit of good clay, suitable for any kind of brick has been located. The same company, it is reported, will build an electric light plant, and also engage in the manufacture of ice. The company is to be known as the Colonna Brick and Tile Company of Maryland, and it is claimed that Mr. Joseph E. Wiedner of Philadelphia is backing the enterprise.

Written for The Clay-Worker.

BRICK AT THE WORLD'S FAIR.

Building Brick from Old World Cities—Displays that are Interesting and Instructive to Builders and Architects.

THE BUILDING BRICK INDUSTRY is well represented in variety, quality and localities at the St. Louis World's Fair. While the common brick manufacturers have taken very little interest in the clay industry exhibit, the front brick and paving brick manufacturers have made some very fine exhibits, particularly the enamel brick people. A student of the brick business in the course of an hour's careful examination of the exhibits in the clay industry display that occupies about half an acre in the northeast corner of the mines building can see every variety of brick produced for the American market, besides a most interesting exhibit of foreign brick, samples having been collected by the National Brick Manufacturers' Association. The public at large is presented with the finest opportunity ever given to see the successful handling of all the different grades of building brick and their skillful treatment by quite a number of architects who have made a specialty of brick.

The educational value of this brick exhibit to the public is bound to reflect upon the entire industry, as it contains so many excellent suggestions and illustrates a breadth of treatment and artistic results, that a layman rarely expects to find in brick architecture. It is fortunate that some of our more progressive brickmakers have taken advantage of this magnificent opportunity that the St. Louis Exposition presents to thus forcefully and pleasingly present the merit of brick to the laymen. While it is to be regretted that this sound, common sense business point of view was not appreciated by a larger number of brickmakers, the entire industry owes a deep debt of gratitude to those who have so grandly risen to the occasion and made the showing that is to be seen at the St. Louis Exposition.

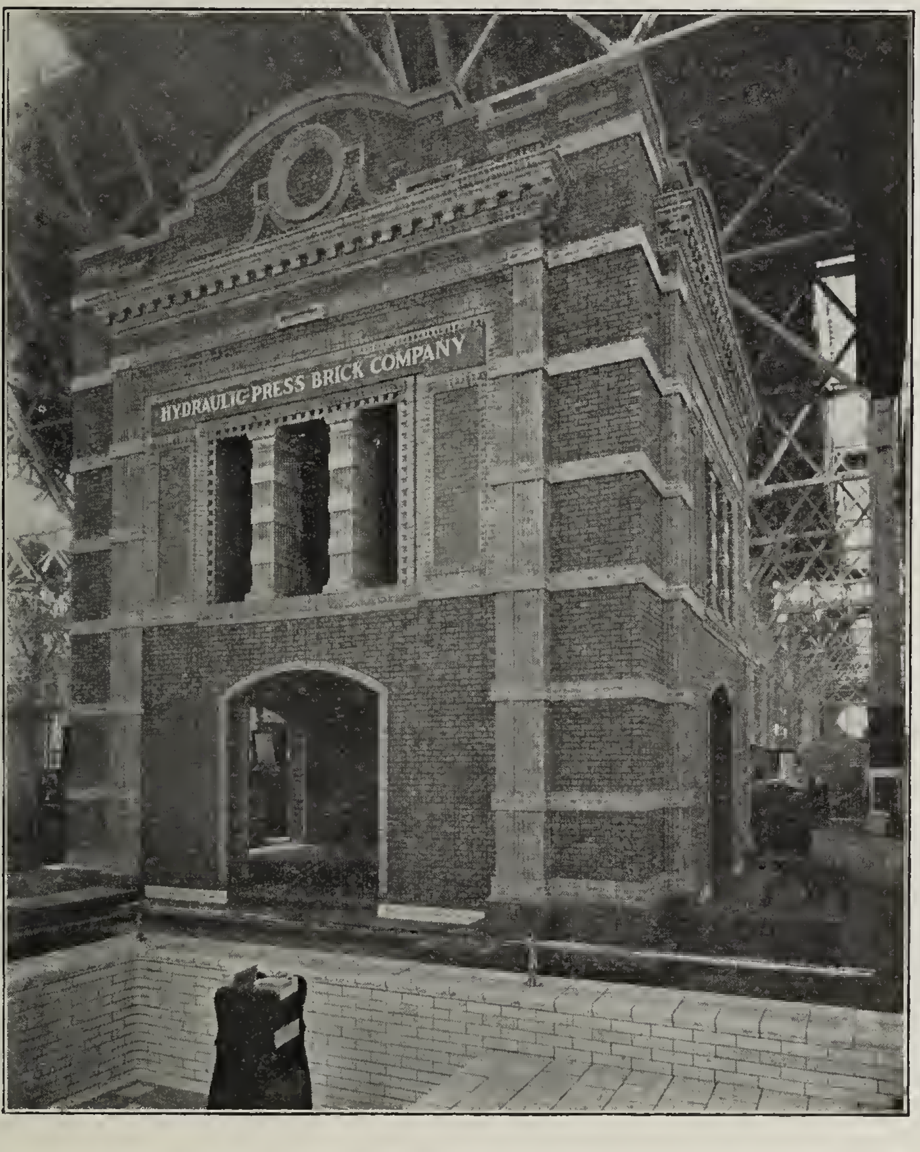


Exhibit Pavilion of the Hydraulic Press Brick Company, Which Occupies the Position of Honor in the Clay Industry Display, Mines and Metallurgy Building, World's Fair, St. Louis.

Starting with the clay industry exhibit, a most complete and comprehensive exhibit is made by Prof. Orton in behalf of the Ohio Geological Survey, in which all of Ohio's clays and clay products are well illustrated. In the Ohio brick section are to be found some excellent shale made brick from the Acme Brick Company, of Marietta, Ohio. It is a side-cut, dark red brick which would make a very pleasing front brick if handled by a capable architect.

The Joshua Oaks Brick Company, of Haverhill, O., exhibit a similar brick, though it is not so hard burned and, to the writer, is not so pleasing for a front brick, though it is an excellent common brick.

The Toronto Fire Clay Company of Toronto, O., show some very attractive and highly sanitary gold colored and brown mottled semi-vitrified brick that should make a very attractive front and which would keep clean in even the dirtiest of western cities.

The Cleveland Hydraulic Pressed Brick Company exhibit several panels of their rich, dark, blood-red pressed brick which for richness of color is unequaled. There is a peculiar tone and depth to the color that has never been produced elsewhere and which promptly marks this brick no matter in what city it is found. In their exhibit they show quite a variety of molded brick, while the pressed brick is shown in standard, Roman and Norman sizes.

The Shawnee Brick Company shows several panels of their flashed and mottled brick which are well known to the brick trade, but they are not exhibited in sufficient quantity to make the impression on the uninitiated public that they deserve.

The Ohio Press brick Company of Zanesville, show three panels of light to very dark iron-flashed brick that would show up richly in certain types of architecture. They show a deep mahogany brown colored brick that should admirably withstand weather and make very strong lines when used as a trimming. They also show some brick with blistered vitrified faces that should appeal to many eastern architects who are so anxious for new effects.

The Iron Clay Brick Co., of Columbus, O., have three panels of light to dark flashed pressed brick in standard size.

The Columbus Brick and Terra Cotta Company exhibit four panels of their gray, old gold and mottled pressed brick, besides several designs in brick moldings. Their brick are beautiful specimens in regard to color and show the highest skill on the part of the manufacturer. It is unfortunate that this company failed to utilize the opportunity of making the impressive exhibit that their product permits.

The Hocking Clay Company of Logan, O., show a small panel of salt glazed mottled brick in plain and rock-faced design. It is to be regretted that the salt glazed brick is not given more prominence, as this is the only exhibit of the sort observed in the entire Exposition, as for durability form crazing it has no peer. While it is true that it is a difficult brick to control the uniformity of color, this to most architects is an attractive feature, as mechanical monotones are happily being relegated to the background by the leading architects.

The Ohio exhibit also presents the solitary sample of the good, old fashioned, hand made, soft mud brick in the Exposition. Mr. Geo. Bowersack of Waverly, O., has one panel of these old fashioned, soft mud brick but unfortunately forgot to send the black flashed brick from the arches which at the Exposition would be most heartily appreciated under the name of "Harvard" brick.

The Purington Paving Brick Compmany of Galesburg, Ill., exhibit in panel No. 1, one of the most attractive bits of brick work at the Exposition. It is nothing less than some overburned pavers that have been rock-faced and laid up with a coarse joint. This panel is one of the richest and finest bits of brick work in its beautiful color and softness of tone, while it should prove most satisfactory in its wearing qualities. In their special exhibit, the Purington Company also show their block size rock-faced pavers of a dark rich mahogany tone, which by some would be regarded as more attractive and artistic than their other panel. They also exhibit, under the name of "Continental" brick, a vitrified standard size brick of a rather dark red which is said to be meeting with considerable favor as a front brick.

The Alton Paving Brick Company also exhibit several panels of rock-faced pavers that enclose their exhibit. These are laid up in white, black and red mortars which is at least very instructive and shows the variety of treatment and abuse that the rock-faced pavers can stand without their beauty being marred.

The American Clay-Working Machinery Company exhibit a large variety of samples from the innumerable brick and tile yards where their machines are used, but they are more interesting to the brickmaker than the public, as it is difficult for the latter to appreciate brick work from mere hand samples.

An Exhibit of Paving Brick and Shale by the Purington Paving Brick Co., Galesburg, Ill.

The Kittaning Clay Company of Pittsburg, exhibit an interesting white vitrified pressed brick in panel No. 2. This is a brick peculiarly adapted to Pittsburg as, being thoroughly vitrified, it should remain tolerably clean, at least after washing. As the color is almost a pure white, the panel would be more attractive if relieved by a shaded border.

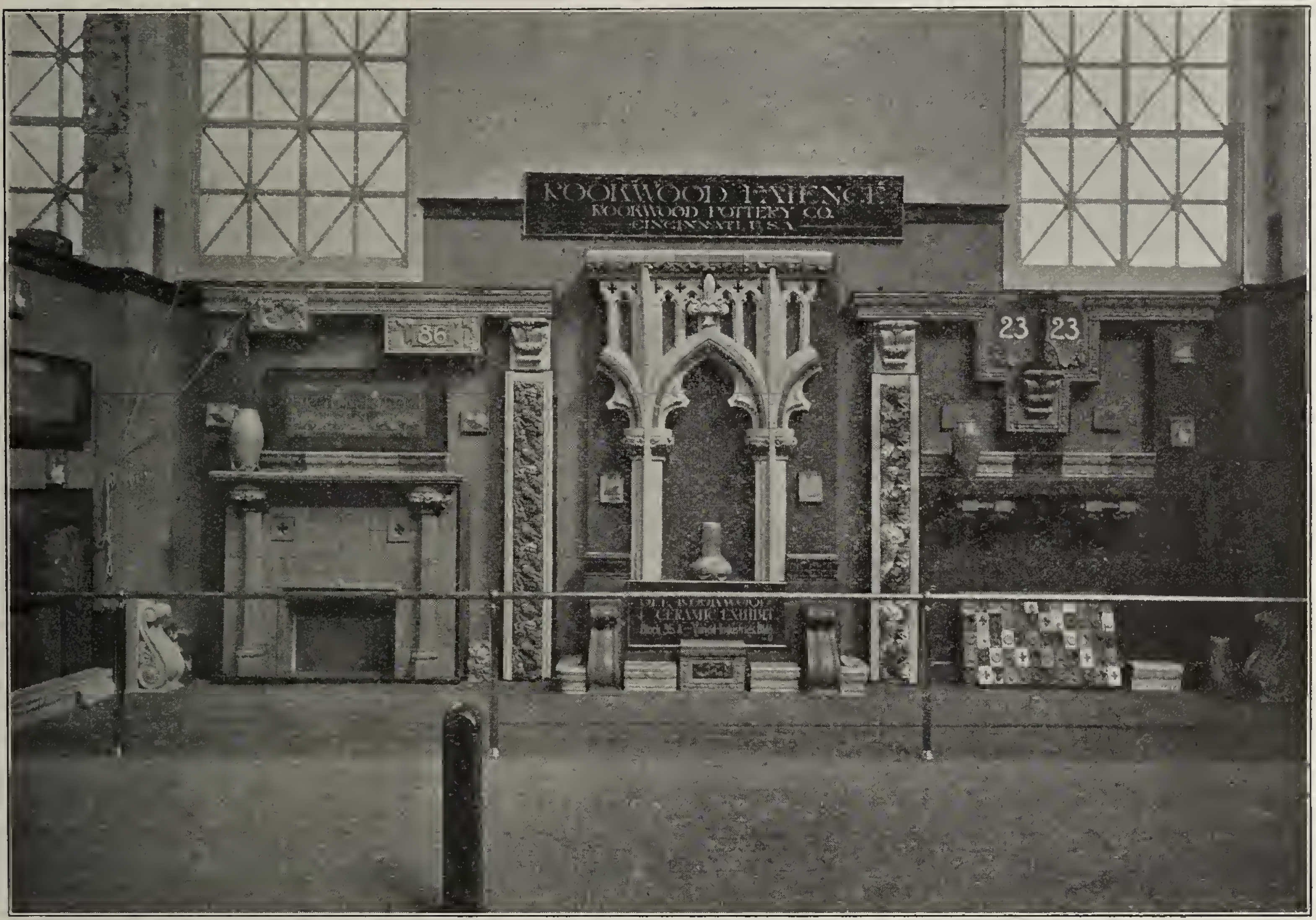
The famous dry press brick of St. Louis is shown in samples and in use as panels in the exhibit of The Scott Manufacturng Co. The St. Louis manufacturers seem to think that the busy visitor to the Exposition will have time enough to visit the brick yards and the architectural monuments in St. Louis, so that this one exhibit is the only example of the growth and development of ths specialty of the St. Louis clay industry.

THE DISPLAY OF THE HYDRAULIC PRESS BRICK CO.

The monumental exhibit of the Clay Industry display, and in fact the finest exhibit of press brick probably ever made, is the beautiful large pavilion that occupies the position of honor in the Clay Industry space. It is a pavilion about 40x40 feet in size and about 35 feet in height. It was designed by Mr. M. P. McArdle who has after considerable thought and study produced a masterpiece. Its excessive weight required the expenditure of over $2,000 for piling that had first to be driven as subfoundation to carry the load. The treatment is in the renaissance style of architecture, which gives the architect full liberty to adapt and embody everything that is good in architecture. Mr. McArdle has certainly selected a most happy combination of colors and design in this pavilion, as the reader may see from the accompanying illustration. The general color tone of the building is derived from iron-flashed brown brick, with lighter trimmings of old gold and light gray, while pilasters of ornamental brick, in imitation of columns, strengthen the vertical lines of the building. It is a most happy combination of variety in color, strength in designing and richness in the shape of ornamental possibilities of brick. The interior of this pavilion is enriched by four beautiful brick mantel pieces that occupy the four corners of the building. One of the mantels is treated exclusively in red brick and it certainly brings out the fact that is not always appreciated that there is nothing handsomer than a good red pressed brick. Another mantel is a dignified design in light gray with ornamental borders. A third design is an attractive bit of panel work with handsome borders in rich, dark-flashed brick. The fourth fire place is a composite bit of work in dark gray brick carrying a flat arch with panelings of green and dark brown enameled brick. The lower interior walls of the pavilion are enameled brick of a light golden color with a frieze of molded green glazed brick, under which are three courses in dark glazed brick laid in checker style. The upper walls of the interior of the pavilion are broken into panels of white enameled brick enclosed within ornamental brick of grays and light browns. The floor of the pavilion is entirely of brick, which is laid in symmetrical geometric designs that give it a mosaic effect. The steps leading to the pavilion are of a dark chocolate pressed brick with rounded nosings, while the adjacent aisle are floored with paving brick.

The general effect of this brick pavilion is certainly most impressive to the layman and an invaluable study of every brick man in the Unted States. It is an exhibit that must be seen to be appreciated, and the entire brick world is under obligations to this progressive, enterprising company in presenting this beautiful study of the masterly treatment of brick in architecture.

Enameled brick is very attractively presented in the fine exhibit of the Blue Ridge Enameled Brick Company of Newark, N. J., who show a large open court in their white enameled brick enclosed with walls that are relieved by panels of blues and grays bordered with ornamental green brick. The handsome case which stands at the head of this court contains a very complete line of the special shapes that are made by this energetic company. This company also exhibits a very attractive wall in white, with dark lines of blue surmounting the base of dark brown, as No. 3 panel of the Clay Industry display. The bull-nosed brick that caps this panel makes a very pleasing finish.



Display of Faience in Colors by the Rookwood Pottery Co., Cincinnati, Ohio.

The New Jersey enameled brick manufacturers at Sayreville and South River, N. J., make modest exhibits, under the auspices of the New Jersey Geological Survey, in pillars that carry terra cotta columns at the New Jersey entrance of the Clay Industry exhibit.

The Tiffany Enameled Brick Company have erected an ambitious pavilion that occupies a most conspicuous part of the Clay Industry exhibit. The Tiffany exhibit consists of panels of white brick surrounded and capped by brick of a light blue color with the doorways trimmed in dark green.

The infant industry of the sand-lime brick process is most attractively and strongly presented by the Huennekes Company of New York. In addition to building a fine classic archway at entrance No. 5, they have also installed panels No. 5 and 6 with their sand-lime brick in a light gray color. The archway is built in large blocks, showing the adaptability of this material to replace either stone or terra cotta; which are shown with both a smooth and rough finish; in fact without any change in color, a most pleasing sympathetic contrast is shown in the archway by the successful handling, side by side, of the rough or rock-faced and the smooth material. They also exhibit a large number of panels, in grays and other colors, from the various factories that they have installed, while a very complete working model illustrates the actual process of manufacturing.

The Schwarz System Brick Company also exhibits several attractive panels of sand-lime brick of different colors and show an interesting series of photographs of the different plants that they have installed.

The wisdom of permitting the sand-lime brick people to exhibit in the Clay Industry is well endorsed by the exhibits, as not only are they exhibited where the public will expect to find them, but are shown under conditions that will make brick manufacturers realize that it is a coming industry. The future that these exhibits seem to indicate should appeal most forcibly to every brick manufacturer who has to contend with high priced coal, poor clays and who has an abundant supply of cheap sand.

There are many other exhibits of terra cotta and faience which will prove of deep interest to visiting clayworkers and which will be fully described and illustrated in subsequent issues of THE CLAY-WORKER.

Dickson Bros. will build a thoroughly up-to-date tile factory at Whiteland, Ind. Work will begin at once. It will have a capacity of 200 car loads a year and will start with two 30-foot kilns and with a dry house 36 x 126 feet. Power will be furnished by an engine of from 50 to 60 horsepower and steam will be used for drying. All sizes of tiles from 12-inch down will be manufactured.

Written for The Clay-Worker.

THE BUILDING SITUATION AT WASHINGTON.

The Important Part Brick and Terra Cotta Play in the Building of the Nation's Capital.

The WRITER, after looking about the District of Columbia, and talking with the brick manufacturers, concluded that the brick and building business here would not be quite as flourishing this year as it was in 1903. But all factories are running, building going on, and apparently every brickmaker will make money. And this is true in spite of the fact that there is comparatively a large number of clayworking factories in and near Washington.

The twelfth census gives the number of brick and tile factories (there are only three of the latter) in the District of Columbia, as eleven; the capital invested in these enterprises was $715,840, and the value of products $364,142. The number of employes was 437 and their wages $166,483. Since the official statement given was obtained by the Census Office no factories of this kind have been established in the District—except by rebuilding after fire. But there are now in and near Washington—all contributors to this market—about sixteen brick factories, the daily product of which amounts to—at full capacity, about 600,000 brick. The latest addition to the factory list is the Anacostia Company's plant, situated at Anacostia, D. C.

If all the new government buildings for Washington, planned and appropriated for, were begun this season, the brick output here would hardly meet the great demand; and the building business would exceed that of the previous year. This amounted in money to $11,584,603. The number of brick dwellings was 938; and 40 apartment houses were also completed, besides office buildings, stores and other structures.

The writer believes that the structural magnificance of the capital city of the country is developing at a greater rate than any other city in the world. This is evident in the grand "palaces" of the *bon ton* neighborhood, but more so in government edifices existing and those planned for and soon to be a part of the city's architectural beauty. There is in "sight" now over fifteen million dollars for new buildings to be erected in Washington. Congress has appropriated for office buildings for the Senate and House of Representatives an extension of the U. S. Capitol; Department of Agriculture, National Museum, District Office and other buildings. The new union railroad station—to cost $5,000,000—is already begun, and among other (private) enterprises, there is to be a national university, composed of a series of edifices, one alone of which—the George Washington Memorial Hall—will cost $500,000. This will be of classical design, situated in the center of the group, in Van Ness Park, near the Potomac river. It will contain an auditorium capable of seating from 1,000 to 1,200 persons, administration offices, class rooms and examination room. The central portion will be a memorial hall about 64 feet square extending upward to the dome. A statue of Washington and memorial tablets will be placed in this hall.

When the government comes forward with a new edifice for its service in Washington, there is a certainty of "something doing" in many spots for various people. Plenty of room must be had for the new building and ample space must be provided for grounds and arboreal and floral decorative effects. Uncle Sam thinks nothing of tearing down a whole square of good buildings—purchased from their owner to be destroyed—when he has a big structure to put up. On the square near to and southeast from the Capitol, on Pennsylvania avenue, one sees millions of good brick that once formed the houses that stood there and recently torn down to make room for the House of Representatives' office structure. The latter and its grounds, to occupy the square, will soon be in process of erection—after the plans come out of the hands of the building committee, when Architect Woods, superintendent of the Capitol, will begin work.

This square is one of the most famous in the city, many of its oldtime residents having been prominent in the affairs of the country. It was included in the Daniel Carroll—one of the original owners of Washington landed property—tract of land transferred to the United States in 1791, for part of the location of the federal capital, but in the subdivision it was divided into thirty-two lots, of which seventeen were left in Mr. Carroll's possession, the government taking the others.

The superintendent of the Capitol has another big building enterprise on his hands—the new Capitol extension. This proposed work is to be done on the east front, and consists essentially of two projections from the center of the edifice. The first of these comes out a distance of 67 feet, with a breadth of 352 feet 4 inches, and the second an additional distance of 41 feet with a frontage of 196 feet, or a total distance of the two projections of 108 feet from the building wall. The lesser projection carries the columned portico and pediment which are the main features of the front.

The plans also embrace a marble vestibule leading from the east wall to the rotunda, forming a grand entrance to the latter. The area covered by the proposed extension is about 35,000 square feet. The total area of the present building is estimated at 132,730 square feet. The estimated cost of this improvement is $2,500,000.

The Agricultural Department has long needed better quarters in which to look after the farmers' and other interests. The present buildings—nearly all of brick—are so scattered about that if a farmer, a stranger to Washington, were to come here to seek information at the Department concerning hollow-horn or bott-fly, he would be as apt to stumble into the mad dog division, where rabies is investigated, as to hit the horn or bott place.

The new building for this department when completed will consist of an administration structure which will be monumental in character, with wings extending from it on either side making a facade about 600 feet in width. Running back from the main building will be similar structures forming U-shaped buildings with courts open on one side. The plans call for five stories. The arrangement of the structures will be such that distinct lines of work can be carried on without interference. This is necessary, owing to the nature of the work the department is doing. Four-fifths of the department's work consists of laboratory investigations, and the laboratories must have special equipments. The building will not be placed on the site first chosen, for this would make it encroach on the 890 feet vista between the Capitol and Washington Monument desired by the parking commission. The plans have been modified so that it can be placed on the south side of the Mall, on B street southwest.

Another edifice which will have its location on the Mall is the new National Museum, the plans for which are about completed, but are not yet given out.

All the big structures mentioned will require large quantities of brick, although their "outer skins" in most cases will be of some kind of stone. But it is probable there will be more brick than other material in them.

A government building at Fort Myer, near Washington, has just been completed. It is built of red brick with stone trimming; cost $40,000, and it is to be used for the convenience and pleasure of the soldiers stationed at the fort. It is two stories in height and contains a gymnasium, billiard room, bath rooms, a general store and other things for the man of war who enjoys the good times of peace.

The buildings at the War College and Engineers' School, at the Washington Arsenal grounds, are progressing and using millions of red brick. And the Washington Navy Yard is also now a large user of this material. The makers of big guns and their equipments are having their plant at this place enlarged, one of the structures for this purpose being a new boiler-house. This is of red brick, and is 98x160 feet in ground dimensions, having two chimneys each, 204 feet in height. The brick required to finish this house will be about 2,500,000.

A structure erected in this Navy Yard for a gun-mount shop sank five feet into the soil, and the work of digging under and building a new foundation is now being done. But before this could be begun it was necessary to remove from the shop all the machinery, a great deal of which was very ponderous.

Written for The Clay-Worker.

DRAFT AND HEAT.

IN RECENT YEARS down-draft kilns have come into use in all parts of the country as a better substitute for up-draft (old fashioned clamp kilns) for the more successful burning of building brick. In many instances the down-draft kilns were a disappointment to many brickmakers, who regarded their money investment for down-draft kilns as good a paying venture as the goose which laid the golden eggs. But why didn't their castles in the air, their hopes, not appear framed with the golden lustre of the beautiful setting sun, as one can observe on the glaziers of the eternal snow and ice-covered mountains of Switzerland? Not because the down-draft kilns were not better than the old style up-draft, but because of the mismanagement of the former. Too much monkeying with the damper results in more failures in burning a down-draft kiln than anything else. The burners want to keep the heat in the kiln and shut the draft off with the damper. Instead of keeping the heat in the kiln they kill combustion by dampering the kiln, and no heat can be made with insufficient draft which produces combustion and generates heat only when increased draft, combustion and heat go together, when one of this combination forces is interfered with the other suffers in proportion.

A kiln set with about 100,000 brick needs a strong draft to watersmoke, it needs a strong draft to expel the chemical moisture and heat up the kiln all the way through, and it needs a strong draft to burn the brick, to solder the impurities of the clay close together and harden or nearly vitrify the body of the clay. It needs a strong draft to make the coal burn without coking, for if the coal cokes it does not make heat, but most of it passes through the stack in the form of black smoke, carbon, coal, pure and simple, and then smothering fires are kept up, the brick in the kiln get all kinds of colors and shades and some are burned up and the bottom courses are nothing but like sun-dried clay, and of course the down-draft kiln is no good, not even as good as the up-draft kiln, when, in fact, it is not the fault of the kiln, but the fault of the man who burned the kiln. Give the kiln a chance and do not shut off the draft. Why is it we build stacks? We build them to have draft, and if it was not for that we would save money by building stacks five feet high instead of 75 or more feet high. In a sewer-pipe kiln of course we have naturally more draft than in a brick kiln, because each stand of pipe forms a small stack and when the kiln gets hot we may have too much draft and it is then proper to use a damper to cut off part of the draft, but in a brick kiln we have different draft conditions, because we have not so much space between the brick as in a kiln of pipe.

WHAT IS TO BE DONE, THEN, TO GET BEST RESULTS FROM A DOWN-DRAFT KILN OF BRICK?

Give it full draft and follow the heat by frequent and light firing, from the time the brick are red-hot no black smoke at all should come out through the stack, nothing but the blue vapor, the product of combustion, then the clay will burn to a clear body and to a natural color, according to the composition of the clay, red, buff or gray. Of course, when a fireman has to fire a kiln every 20 minutes, he cannot lay down and take the customary nap. A man that draws his wages for twelve hours' firing and takes a nap of three or four hours at night, instead of firing his kiln and increase the heat, thereby saving coal, is not deserving a job. He is a thief, who steals the money from his employer for the time he sleeps, and not only this; he is also the cause of bad burns, over burned and soft, unsalable brick. If I hired a man to fire a kiln every time she needs it, and I would find him asleep at night with the damper down on the stack, I would not want him for 50 cents a day, and if he promised to do better and not neglect his fires any more I would not believe him. He is going to neglect his duties as soon as I am to be supposed in bed. What improvement it would be if we could invent a system which would burn our clayware, the kilns only fired in day time. Who does not agree with me, that nine-tenths of the damage done in burning is done at night? I see the time coming when clay will be burned with electricity, one operator being necessary only to press the button at the office. A night operator must have a guard to watch him, to see that he does not fall asleep, and that guard must have another guard to watch him, and so on. Of course these electric burners will gradually be so finely arranged that whenever the operator falls asleep he will receive an electric shock which will waken him up, and awake he must be, because he must increase the heat from time to time on the different kilns at the different stages of the burn by turning on more electricity. Will this not be the ideal way of burning clay? I think it will be, but it will not be perfect. Why? Because there is nothing perfect in this valley of misery. In conclusion, to come back to the question of up-draft or down-draft kilns, I have to say this: Whenever you cut off the draft you will do just what is done at a formation, where the water is forced into the air and as soon as you shut the valve partly, the water does not go so high for lack of pressure, and when you shut off the draft on a down-draft kiln, the heat does not come down to the bottom of the kiln, because the valve is shut off and there is no outlet for the heat, for lack of draft, for lack of an opening at the valve of the stack. Is it any wonder that the most heat is kept on top and overheats it and never burns the bottom courses? Draft, combustion and heat are the agents to burn brick nearly perfect and the down-draft kiln is in the right place with the right man.

Nothing succeeds like success. Draft on an up-draft kiln will be my next paper, dealing with too much and not enough draft.

German-American.

PALACE FROM THE ANCIENT PAST.

One of the Oldest Structures in the World Re-erected at the World's Fair.

THE PALACE OF DAMASCUS, an edifice so old that its builder, its occupants, and its history are lost in the obscurity of the past, is being re-erected at the World's Fair. The structure which was brought in sections from Syria, will stand on the north terrace in front of the Administration Building, symetrically with Italy's pavilion. A portion of this famous building was exhibited at the Chicago Exposition, and another part was on exhibition at the Antwerp Exposition in 1877. But at the World's Fair the whole of the building, which time has left standing, will be seen for the first time. All the woodwork of the palace is of the hardest wood in the world, so hard that it has lasted as long as stone. The palace itself has long been a subject for conjecture and controversy among archaeologists for years. The part that still remains is forty feet long by sixteen feet wide. The central roof is twenty-five feet, and the roof of the wings sixteen feet in height. The palace will contain a rare and beautiful collection of Greek and oriental art. It includes Greek, Russian, and Byzantine paintings, so old that in many cases the very names of the painters are forgotten, and in colors whose blending and permanency has become in a great measure a lost art. Among a collection of rare Persian and Syrian rugs is one taken from the Alhambra. The palace is being erected by Mordecai Benguiat, of San Francisco, Cal., and the treasures which it will contain are the property of his father, H. E. Benguiat.

Ceramics at Leipsic Fair.—Ceramics were brilliantly represented here, notably in German and Austrian productions. There was not much that was really new, but a renovation, or a modification of the old, that had a very fine effect. Blue and white decorative effects seemed to be in considerable demand, particularly by American buyers.—*Moniteur de la Ceram.*

Bunzlau Ware.—The question is asked as to the kind of kilns used for burning Bunzlau ware; at what temperature is it burned? What fuel is used? How the glaze is applied to the inner and outer surfaces? Are the goods burned in saggers? The Bunzlau potters have always used the down-draft kiln, known as the Cassel kiln, in which the fire enters the kiln over a fire wall at one end. The highest temperature is cone 10, the lowest, at the flue, is cone 4 to 7. The fuel used is Bohemian lignite. The glaze is applied to the outside and the inside of the ware when green, in leather-hard condition. The outside is glazed by dipping, on the inside the glaze is applied with a pump. Only three rows of saggers are used, these are set against the fire wall, the rest of the ware is set without any protection.—*Thonind. Zt.*

Glass Wool.—The glass wool which is used for chemical purposes, for filtering acids, etc., is a very useful product. This is made from glass in a soft state. Strips of glass of about an eighth of an inch thick are softened in the flame of a glass blower's lamp and from these thin threads are drawn out. The commencement of the thread is then attached to a drum, which revolving continues to draw out the thread. These threads of glass are from two-hundredths to four-thousandths of an inch in thickness. The drum must not be too small, so as not to bend the glass filaments too sharply. The diameter of the drum or wheel is generally forty inches. The speed of the revolutions of the drum has an influence upon the quicker or slower drawing out of the threads and this speed is regulated according to the required strength of the glass filaments. The usual speed is about three hundred revolutions a minute.—*Keram. Rund.*

White Portland Cement.—A manufacturer desiring to produce from three to four car loads of snow white Portland cement, asks what materials he should use and how they should be burned. The reply to this that up to the present time no one has succeeded in producing a snow white Portland cement, though a few works turn out a pale cement which is suitable for light colored work. An English patent of June, 1902, by W. H. Martin, is for a hard, white cement, similar to Portland cement. This is stated to be one part of kaolin or China clay, free from iron, to which is added from three to five parts of clean, white chalk. To the mixture is added from two to five per cent. of its weight of gypsum, or from three to five per cent. of magnesium chloride. The materials are well mixed, either in a wet or dry state, and burned in a kiln. All the white cements now on the market are varieties of gypsum.

Asphalt Paving.—The use of asphalt for paving purposes has considerably increased in our cities of late years and the properties attributed to it, which cause it to find favor, are the ease in keeping the pavement clean, its noiselessness and the facility with which it can be repaired, but if these qualities are to be assured then the selection of the raw material must be right and the preparation and laying of it must be suitable. Among the raw materials are several kinds of asphalt rock, which experience has proved to be satisfactory, but all the artificial mixtures have either failed utterly or else they have been extremely unsatisfactory. The reason for the many attempts to produce an artificial asphalt is the need for a cheaper material than the natural rock asphalt will give and notwithstanding the repeated failures in this direction new mixtures are continually being brought forward. A recent one is patented in Germany by M. Ketterel and E. Koellner of Leipsic. It is intended to produce an asphalt pavement by a cold method, without heat or stamping with hot iron rammers, or the use of hot smoothing irons. This patented method consists in mixing a powdered asphalt with glycerine and litharge, the mixture is then to be spread over the foundation or other surface and smoothed or rolled cold. The statement is made that this mixture of glycerine, litharge and powdered asphalt is weatherproof, which we venture to doubt. A mixture of glycerine and litharge, forming a useful and durable cement, is nothing new and we are surprised that the patent office should have granted a patent, but besides this a pavement, of whatever materials, must wear and the result of wear in this case, the dust, being in part litharge, would be highly poisonous. According to the patent the best proportions to employ are to 100 parts asphalt powder 15 parts litharge and 10 parts glycerine. The addition of litharge and glycerine would considerably increase the cost of an asphalt pavement because either of these materials is dearer than asphalt itself. Should this patent paving come into practical use we are curious to know what the sanitary authorities would have to say to the use of litharge on our streets.—*Deut. T. & Z. Ztg.*

Water Coolers.—In answer to a question as to the mixture and preparation of clay for porous water coolers (known in the South as Cuban monkeys) and the best way of setting the ware in the kiln. These goods are made from a clay that produces a strong, though at the same time a porous biscuit, so that the water will ooze through very slowly and the outer surface remains always wet. A good, plastic clay is used, a clay containing sand in a very finely granulated form. Calcine may also be used, but the calcine must itself be of a porous nature after burning. The porosity of the mass is sometimes increased by the addition of organic materials, which are destroyed in burning, but these materials must be in the shape of a fine dust or the pores will be too large and the water will flow instead of sweating through. Finely sifted sawdust or finely ground charcoal gives us the desired degree of porosity. These water coolers can be burned in either a down-draft or a continuous kiln. They are best burned in saggers.—*Thonind Z.*

Competition in the Dortmund District.—In consequence of the Bochum Brick Manufacturers' Sales Association, which terminated on the 31st of December last, not being renewed, the Rhein-Westphalian Brick Syndicate has determined upon a vigorous war with the Bochum manufacturers and fixed the price for the Bochum district at 12 marks ($2.82) per thousand at kiln. This is for the German standard of 9⅞x4¾x2½ inch. At the meeting when this course was decided upon it was openly stated that the object was to force the Bochum manufacturers to come to an agreement for a regular price, and the hope was expressed that they will soon see that it is to their interest to do so.—*Thonind. Z.*

Rakonitz Shale Clay.—Reference is frequently made in the writings of Seger and other German ceramists to Rakonitz clay. A description of it may therefore be of interest. This shale clay lies either between coal strata or underneath them, and is got by mining. There are two kinds. One resembles coal and, so far as color, is difficult to distinguish. This often contains as much as 40 per cent. combustible in the shape of particles of coal. It can only be used for making calcine. The second kind is of a dark gray color and shows a conchoidal fracture. It is almost entirely free from admixture of coal. This latter kind, particularly in its unworked state, is used for fire brick requiring a high content of alumina. From its peculiar composition no addition of calcine is necessary. To work the shale clay it is reduced by a pan, a disintegrator or a ball mill to a size of grain of from three to five milimeters. Then, without adding any other clay, it is moistened and put through a pug mill. After this it is only left in the soak or curing pit, but it has to remain for a long time. The material prepared in this way is then formed on a machine or by hand molding. On burning it to Seger cone 12 the shrinkage, according to the degree of fineness of grinding, is from 10 to 15 per cent. Pieces molded from this, if not of too large dimensions, do not exhibit cracks either in drying or burning. The fire bricks made from this shale clay are rich in alumina. They show a content of alumina of from 43 to 46 per cent. They have the same melting point as Seger cone 36. The bricks made from this clay show, for fire bricks, remarkable strength and firmness. They are used for a great number of industrial purposes for furnaces of all kinds, with the exception of those that require bricks in which silica predominates. The Rakonitz fire bricks are especially valuable where they have to resist a slag that is rich in fluxing matter. The clay in the raw state has the following composition per cent.: Silica, 45.08; alumina, 39.55; iron oxide, 0.15; loss by ignition, 14.03. The burned clay is calculated as follows: Silica, 53.07 per cent.; alumina, 46.55; iron oxide, 0.18. An analysis of the Rakonitz calcine published in 1886 shows the following percentage composition: Silica, 52.50; alumina, 45.21; iron oxide, 0.81. A recent analysis gives the following: Silica 52.44; alumina, 46.00; iron oxide, 0.18 per cent. From the two last analyses it will be seen that the composition of Rakonitz calcine has remained very nearly the same during the past seventeen years, which is certainly a very noteworthy fact.—*Thonind Z.*

Slaking Lime Under Pressure.—It has been stated that the slaking of lime in a closed drum, where the heat set free by the operation is retained, is a novel technical effect. As this may lead to errors, it is well that certain restrictions should be placed upon this view. How necessary this is we may infer from the fact that it is an old experience that in slaking lime it must not be allowed to become too hot or it will "burn"—that is, become of a sandy character and lose its value. On carefully considering these apparently contradictory data, it must be recognized that retaining the heat by slaking lime in a closed vessel, as in the lime-slaking drum, may, under certain conditions, just as easily present disadvantages as advantages. It will therefore be of importance to discover the points at which the advantages or the disadvantages appear. The slaking of caustic lime, or the turning it into a hydrate, is, from the chemical point of view, an exothermic process—that is, the slaking is accompanied by the evolution of heat. This change takes place at the ordinary temperature and a preheating of the lime is not necessary, inasmuch as heat is given off in slaking; but we must not lose sight of the well-known fact that chemical processes are more active in heat. It therefore follows that slaking will be hastened by the heat evolved. On the other hand, too much heat will be harmful, as was mentioned above. Bearing these points well in mind, we can easily find the explanation why it is desirable to retain the heat while slaking, and this the more so when it is a question of a slow lime and we wish to reduce the time of slaking—a case which quite frequently occurs. The use of the closed drum seems to be considerably more important in one particular, that there is an equal distribution of the heat. In this way we avoid local overheating by which portions of the lime are "burned." This treatment is only to be recommended for a slow lime. If we retain the heat in a very quick lime, one that has a very quick reaction, we burn the slaked lime, as many manufacturers of lime-sand brick discover to their cost. With such material we can only get a good slaked-lime powder by carrying off the heat. The carrying off of the heat is accomplished in the simplest manner by the admixture of sand, as was originally proposed by Kleber, who mixed ground lime and wet sand together. In this way he slaked a quick lime without burning it. The proposal has recently been made to slake the lime by increasing the quantity of water, but this is obviously useless, for to cool off a good quick lime it would be necessary to use so much water that we would have a solution of lime instead of slaked lime in a powdery condition.—*Thonind. Z.*

Iron or Tile Stoves.—An enquiry is made as to the better means of heating a schoolroom containing a space of 6,500 cubic feet, whether by means of an iron heater or a tile stove. The answer is that a tile stove, made of fire bricks and tiles, is much to be preferred to an iron stove. A suitable size for heating the space mentioned would be 50, or better still, 56 cubic feet; that is 4¼x3x11 tiles, or 5x3x11 tiles, exclusive of the base of a half tile, but including the crown. It is important that the stove should not be set in the corner of the room, but in the middle of the longest side, opposite the windows. A tube of about six inches diameter should be run under the floor from the outside of the building to the stove. The warming of an apartment by means of a fire-brick tile stove is much more even than with an iron stove. The tile stove, when properly constructed, is more economical in fuel. There is little or no inconvenience from radiant heat as is the case with an iron stove. When once the brick-tile stove is well heated it forms a reservoir of warmth which it gives off slowly during the whole time the school is in session. While the stove is being heated the windows can remain open, because the material of which the stove is built takes up the heat from the fuel and none is lost through the open windows. As soon as the stove is sufficiently heated and begins to give off warmth the windows are closed. We can generally, at the same time, close the fire door and ash door. In this way we only get good, fresh, warm air. The iron stove only gives off heat so long as a fire is burning in it. Iron is a very good conductor and when there is a good fire in it, the stove becomes so hot that the radiant heat from it makes itself uncomfortably felt in the immediate neighborhood of the stove. The hot iron consumes a considerable quantity of the oxygen in the air, which becomes dry and unhealthy. Letting in fresh air from the outside does not improve matters much, because to warm this more fire is needed, which in its turn destroys more air. Where iron stoves are preferred for heating schools, etc., it is only because the tile stove is more easily damaged by improper handling. This evil can be avoided by right management. The best course is to see that the one whose duty it is to attend to the stove knows what he ought to do and then insist upon his following the instructions. It is a mistake to start the fire at seven or half after seven in the morning when the school opens at eight. This should be done early enough to have the room thoroughly warmed before the lessons begin.—*Thonind. Ztg.*

Written for THE CLAY-WORKER.

KANSAS CITY BRICK AND BUILDING NEWS.

THE BRICK manufacturers of this city have been exceedingly busy during the past month, but still they are supplying the demand, and the prices of brick are holding steady at the figures made early in the season. for the past few weeks it has been pretty hard for them to keep up with the demand, on account of the inability of the railroads to make delivery of Kansas gas belt brick in this market, the floods having knocked out about all the railroads in that State for a longer or shorter time. It is understood that but a few of the plants were damaged by the flood, and most of them made a good deal of brick during the period they were unable to ship, but they were not able to market them for a good while, as the State was pretty generally flooded.

Kansas City is the natural market for all the brick made in the Kansas gas belt, except what is used in that territory, and so a failure to get any brick from that State for a few weeks makes a great difference with the demand on local plants, and the jobbers who carry a surplus of brick in their distributing yards.

Considering the great amount of unfavorable building weather in the month of May, it was a decidedly good month in the building line, surpassing the same month of last year. The report of the superintendent of buildings of Kansas City, Mo., shows that there was an increase both in the number of permits and the cost of the buildings to be erected, as compared with last year. During the past month there was 393 permits, as compared with 350 permits in May of last year, and the total cost is put at $702,601, showing an increase of $78,341 over the same month of last year. The remarkable part of the showing is the fact that this increase was made almost entirely with residence permits, as that is about all the new permits which have been issued.

One day of last month the building inspector of Kansas City, Kas., issued permits for buildings valued at $585,700, but the most of this was for buildings already under course of construction, being a part of the new packing plant of Nelson Morris & Co. Two of these buildings were to cost $250,000 each, one being a six-story 622x150 brick building, another 460x150 six-story brick, and the third was for a two-story brick, 180x110, to cost $75,000. All this brick is coming from the Kansas gas belt.

The sheep shed now used for a union depot, which has been a disgrace to the city for many, many years, is to be replaced some of these days, so rumor has it, and there is a great deal of building depending upon this move. It is hardly thought possible that a new depot will be built under the hill, where the present one is located, but the railroads do not seem to be able to all get together on any one location, so it is expected that two depots will be made, one on North Grand Avenue and one on the same street, where it crosses Twenty-second street. If this arrangement is made, or any other arrangement for that matter, there will be a great many new business buildings erected at once, for even if the new depot was built where the old one now stands, it would be certain that many new buildings would be built around it, as the owners of property would feel that they knew what the future held in store for them. With the present uncertain conditions none of this building can be figured upon.

The Pittsburg Brick Company reports putting in two new kilns in their plant in Leavenworth, Kas., and one new one in their Sycamore plant. They have also erected a new brick office building at the Sycamore plant.

The Kansas City Hydraulic Pressed Brick Company is reporting a great demand for brick in, and around, Kansas City. They have to call on their outside plants to help keep up with the demand, and were knocked out of getting regular shipments from Chanute for a week or so on account of railroad washouts, although the plant itself was high and dry above the flood.

J. M. Searles & Son of 604 Postal Telegraph Building, are reported to have closed up a deal whereby they will be largely interested in a new brick plant which is to be built in Sycamore, Kansas.

The Metropolitan Street Railway Company of this city, has been tearing up the streets, putting down new tracks, and making many changes, and as the asphalt companies were very slow about putting down new pavement, they asked the city to allow them to pave with brick between their tracks. This request was refused, as the ordinances provided that the company must pave with the same material used in the rest of the street.

The many Republican friends of Walter S. Dickey are bound to land him either as State Chairman or as a Republican National Committeeman. As they are now trying to land him in the latter place, and it is understood that Mr. Dickey is not averse to accepting such a place. Mr. Dickey is well known to the trade, as the head of the Walter S. Dickey Clay Manufacturing Company.

J. O. Miner, formerly of Empire, Ohio, has accepted a position with the Pittsburg Brick Co., as Superintendent of their plant in Leavenworth, Kas.

Rosedale, a suburb of this city, seems unable to get its streets paved. They advertised for bids for paving with asphalt, and did not get a single bid. They are now figuring on advertising for bids to pave with brick and will probably then meet with better success.

The United States Supreme Court has handed down a decision in the case of Richard H. Field, of this city, against an asphalt paving company, which is of interest to all paving contractors. Field sued to have assessments for the pavement of streets in the town of Westport, Mo., then a suburb of Kansas City, declared void. The court upheld the power of the town authorities to make the levy and overruled the decision of the United States court for the Western District of Missouri, relieving Field from payments for improvements on Wyandotte street on the ground that such improvements were not needed. Justice Day said that the city authorities were the sole judges of such necessity and that the court should not interfere.

The Pittsburg Brick Company has been selling a large number of paving brick for use in Kansas City, Kansas, one contractor over there having ordered 2,000,000 brick from this company, and there are a good many contractors in the paving field on that side.

F. L. Dickey of the Walter S. Dickey Clay Manufacturing Company, who accompanied the Commercial Club on its recent trade extension trip, found many people in Chanute, Kas., ready to ask questions as to when they might expect to see the new plant established in that place, but there are a few little side questions to be decided before an answer can be given to such inquiries.

The Independence Shale Brick Manufacturing Company has been reorganized with R. B. Trowbridge as president and treasurer. The company owns property east of Independence on which it is said to have well located beds of brick shale.

The Supreme Court of the State of Kansas has recently handed down a decision in favor of the Coffeyville Vitrified Brick and Tile Compeny, which is of interest not only to brick manufacturers but to all manufacturers of the State, as it knocks out the statute which made it unlawful to discharge an employe because he belonged to a labor organization, and provided for the recovery of damages for such discharge. "T. P. Berry, an employe of the Coffeyville Vitrified Brick and Tile Company was discharged from its service and he brought action to recover damages, alleging that he was discharged because he was a member of a labor union. He recovered a judgment in the lower court and the brick company appealed, attacking the constitutionality of the law. The court declares the law void, saying: 'Any act of the legislature that would undertake to impose on an employer the obligation of keeping one in his service whom, for any reason, he does not desire, would be a denial of his constitutional rights to make and terminate contracts and to acquire and hold property.' "

The Coffeyville Vitrified Brick and Tile Company had to keep a force of men at work a good part of the time of the recent flood, reinforcing their dikes, to save the plant from being flooded.

The Arkansas City Natural Gas Company announces its intention of establishing a brick plant at Peru, Kas., where it will make use of the natural gas which they already have in abundance. They are now trying to get in touch with some practical brick man, who is in a position to take hold of their proposition.

The Gainesville Brick Company of Gainesville, Tex., has filed an amendment to its charter, making the capital stock $50,000.

J. C. Christensen is reported opening a brick yard in Haines, Ore.

The Straub Pressed Brick Company has been incorporated in Helena, Ark., with a capital stock of $20,000.

C. F. Boahme has begun the manufacture of brick in Coeur d'Alene, Idaho.

W. G. Hunt has opened a new brick plant in Sand Point, Ore.

R. E. Smithen has disposed of his brick plant at Holton, Kas., to C. J. & W. H. Wylie, Jr.

Edw. A. Swift, a brick and tile manufacturer of Washington, Iowa, has given a bill of sale for $5,700 to Flint & Mostaler.

C. A. W.

A TEXAS BRICK PLANT.

The Brenham Brick Company, of Brenham, Texas, with Mr. A. L. Jackson as manager, have added to and improved the plant until they are now putting in the machinery that will enable them to turn out 25,000 brick per day. The field from which they procure their clay, it is estimated, will supply them for the next 100 years, and is easy of access, lying south of the yard, but up a considerable grade, and in order to save hauling they have built a tram railway and equipped it with cars that at present extends 2,500 feet to the pit, where the cars are loaded with scrapers and turned loose, reach the machine by gravitation, the empty cars being hauled back by a mule alongside of the track. The dirt is dumped under a shed right at the ponderous grinding machine before it passes through elevators to the big Ross Keller triple pressure four-brick machine. Just south of the machine are three large kilns, with walls nearly four feet thick, that will hold 250,000 brick each, and these are equipped with oil burners, the management claiming that this gives a more uniform heat and uniform color to the brick. The foundations have just been completed for a new eighty-five-horsepower engine and one hundred horsepower boiler for the increased capacity and machinery that they contemplate putting in at an early day. Everything about the yard has been put in with a view to permanency and is first class in every respect, and the quality of brick is improving with each kiln, the product of the last kiln being pronounced by experts as fine as can be produced in Texas.

The machine which does not answer your purpose may be just what some one else needs. Tell the "needee" about it in a card in the "For Sale" columns of The Clay-Worker.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Information Wanted About Kilns and the Sand-Lime Process.

Dear Sirs—Please send me a sample copy of THE CLAY-WORKER. I would like to correspond with some parties with up and down-draft kilns, also with manufacturers making machinery for lime and sand brick. Am thinking of changing my plant and putting in an up-draft kiln. J. V. McGLEISH.

Whiteville, Tenn.

WANTS A GOOD DRY PRESS.

Editor CLAY-WORKER:

In addition to handing you my check for THE CLAY-WORKER will say business is good in our line. The Knickerbocker Construction Company of New York is building 600 brick houses on an allotment joining our property, which requires 16,000,000 brick. With what other building there will be this year about 25,000,000 brick will be used. Our mountain city is getting a hustle on and doing more brick building and not so much wood as in former years. We are running day and night to keep up with the demands. We would be pleased to correspond with some party who has a good dry press for sale.

ALTOONA BRICK AND TILE COMPANY, LTD.,
J. B. DEHAVEN, Pres. and Gen'l Manager.

Altoona, Pa.

A NEW HIGH TEMPERATURE KILN.

Editor CLAY-WORKER:

I have been intending to write you and would have done so before this, but that I have been so extremely busy. We have recently built a new kiln. It is not very large, but is constructed on a radically different principle from those in vogue in this country. It is a kind of a down-draft, something like the Lonholdt kiln used in Germany. It is built for very high temperatures, and is intended for glazed tile, which we are now manufacturing. As soon as we have tested it thoroughly will tell you more about it.

We would like to get into correspondence with a good man who is thoroughly familiar with the manufacture of glazed tile. One who is willing to work for reasonable compensation at the beginning will be given a permanent position. We do not want a man to stand around and boss the job, but one who knows how the work should be done and is willing to do a part of it himself. I would like to correspond with an all-around good workman, who can address me, care of THE CLAY-WORKER. S. L. P.

A GOOD PLACE TO LOCATE AN UP-TO-DATE BRICK AND TILE PLANT.

Editor CLAY-WORKER:

Should you have an inquiry from a patron for a location for an up-to-date brick plant you will be doing him a great favor by advising him to investigate the opportunity open at Coalgate, Ind. Ter. Coalgate is a city of 7,000 population and is growing fast. In addition there are numerous new towns springing up along the routes of the new railroads which have been recently built, all of which are in need of brick, and they are supplied by shipping them from Missouri and other distant points.

The rapidity of the growth of these new Southwestern towns are wonderful and have no counterpart in the older communities. There is an abundance of good clay and shale for making both building and paving brick, fuel and labor are cheap and there is nothing to stand in the way of an energetic man who understands his business in establishing a paying industry that will increase as the country grows older. The Indian lands are now coming on the market and the country is entering on a period of marvelous prosperity, which the brick factory will share if it is located soon. I will be pleased to furnish any desired information from interested parties on application.

Coalgate, Ind. Ter. J. M. CRAYTON.

SEEKING AMERICAN IDEAS AND IMPROVEMENTS.

Editor CLAY-WORKER:

As you no doubt are aware, the Institute of British Clayworkers are organizing a trip to the States in October next. Our managing director, Mr. J. D. Sutcliffe, will be with the party. We have a large connection with the brick trade in this country, and have given special attention to dryers and mechanical draft installation on kilns. Mr. Sutcliffe will be very glad to get in touch with any of your readers who may have something novel in this branch of the business to show him. He will be willing to enter into negotiation for either working the specialties in this country on a royalty or acquiring the patent rights for the British Isles. We are always interested in American ideas, and THE CLAY-WORKER is one of the most valued papers we receive.

THE SUTCLIFFE VENTILATING AND DRYING CO., LTD.

Manchester, Eng.

INFORMATION DESIRED ABOUT THE CLAYS OF INDIANA.

Friend Randall:

It has been decided to get out a new report on the clays and clay industries of Indiana, as the one I got out in 1895 is out of stock and out of date, and I have numerous requests for such a work. I wish you would make a note of this in a forthcoming number of THE CLAY-WORKER, and advise parties who have large deposits of clay suitable for manufacture in the State to send samples of the same to me, and also full data regarding its location, thickness of deposits, etc.

I have been out in Fountain and Montgomery Counties this week. Have visited the plants at Veedersburg and Crawfordsville, and also deposits of clay in the vicinity of Attica. I expect to spend most of the summer gathering data for the report. W. S. BLATCHLEY, State Geologist.

COLORADO POTTERY FOR THE WORLD'S FAIR.

Written for THE CLAY-WORKER.

The Van Briggle Pottery Company of Colorado Springs has increased its capital stock from $50,000 to $75,000 in order to raise additional funds for exhibition purposes at the St. Louis Fair. As works of art, this pottery will create even more comment at the fair than it did a year ago when exhibited at the Paris salon. Mr. Van Briggle has been working on his secret for twenty-five years, but the product has been on the market less than two years or since the company was formed which bears his name.

The company has just completed the firing of a kiln of over 700 pieces for the exhibition. There are many striking designs. One in which Mr. Van Briggle takes particular pride is a tiny vase less than three inches in height. Its body is a deep green and over this is transparently spread a golden yellow giving the appearance of a fluid running over the vase. Another interesting piece of work is a large lamp design in yellow which shadows unconsciously into a royal purple.

All of the pottery is characterized by a mat, or dull glaze, differing materially from that of other wares. The pottery is also in a great variety of tints and most of the designs are adaptations of Western flowers. M. S. C.

CLAY IN NORTH CAROLINA AND BRICK IN VIRGINIA.

Editor CLAY-WORKER:

Few people outside of the immediate section know that the clay for making the celebrated Powhatan brick that is shipped from Richmond, Va., comes from Cleveland County, N. C., near the South Carolina line, and that the clay beds in that section are large. At Grover, a small station on the main line of the Southern Railway to Atlanta, this company has sheds built for handling, drying and loading the dirt.

Farmers are paid so much per yard for the clay, and so much per yard is paid for hauling it to the railroad. Delivered there it is wheeled upon a flat kiln, a car load at a time, under which are a number of flues, and in which about three cords of wood are burned, before it is dry enough to put in the car. That done, the dry dirt, which has lost perhaps a third of its weight, is wheeled into a car and started to the factory, at a cost for freight alone of $40.

This work goes on from day to day, all the year, and has gone on from year to year. The pay-roll for loading and drying runs from $10,000 to $12,000 per year, and from 700 to 800 carloads are used in the course of a twelve months, the amount paid for the clay not being counted in this.

Asked why the factory was not moved to this place and save all this expense, was told that the freight rate on the finished product was at such a rate from a non-competitive point as to make it a money saver to ship the clay at the cost named above. Was also told that this clay is ground and bolted at the factory before going into the machines.

The bricks burn white. Last year a million of them were shipped to Atlanta, and had to pass over the identical spot the clay was loaded.

At first glance these figures seem to preclude any profit in a brick business, but they sell very high, as compared with ordinary building brick. To the small town of Grover this industry is a great boon.
A. Cracker.

Charlotte, N. C.

Good Words for the Clay-Worker from Tennessee.

Editor Clay-Worker:

Please find enclosed check for $2 for The Clay-Worker for another year. The Clay-Worker is always a welcome visitor.

Business is good with me; have more contracts booked than I ever had at this season of the year. I have opened up a new yard at La Center, Ky., and have a contract there for 1,400,000 at $5.50 in kilns. I am running full time at home, making 25,000 per day of ten hours. Long live The Clay-Worker and its editor.

Respectfully,
John G. Walters.

The Hudson River Outlook.

Editor Clay-Worker:

Gentlemen—Enclosed please find check for Clay-Worker. Please excuse delay in settling. Intended to fix this up at the convention, but, as usual, in the rush it was overlooked. Indications are not particularly favorable for Hudson river manufacturers the coming season. The coming elections and labor trouble in New York City last year seems to be holding things down some, though I understand the value of plans filed thus far with the Building Department is nearly equal to last year. It is possible that labor troubles of 1903 will be most felt in buildings using steel frames and few brick, while brick buildings may be little affected.
Jay Terry.

Kingston, N. Y.

"The Clay-Worker About Perfect."

Editor Clay-Worker:

Dear Sir—Enclosed please find $2, which I consider a good investment. The Clay-Worker is about perfect, containing all useful information in its line, and is full of general information besides. A trade journal that my wife will read before her Delineator is immense. Your journal is an album. I enjoy the photographs of successful brickmakers, and will soon know them all without meeting them. Your Mr. Randall is all right.

Of myself I have nothing to say except that I have no one to buck now except the Purington Company, since they have bought the Galesburg Paving Brick plant. It is a good thing for them, however, that I make tile instead of brick.

Respectfully,
D. O. Loy.

Wataga, Ill.

A New and Prosperous Missouri Brick Plant.

Editor Clay-Worker:

Enclosed please find check for $2 to pay subscription of The Clay-Worker for one year to April, 1905.

As we are now in the brick business, we have found The Clay-Worker to be a valuable book of reference and instruction to us. We constructed our plant last season and this is practically our first season of production, as we only made a few kilns of brick last season for a trial. We have just finished burning our first kiln of dry press brick for this season, and the results are all that we could wish for. Our making machinery consists of one four-mold American dry press, one four-mold Simpson dry press and one No. 2 Giant mud machine, making a total daily capacity of 40,000 dry press and 35,000 pavers, when we will have enough kilns constructed to take care of the output. At present we have four Swift patent updraft kilns of 260,000 capacity each, but will commence to construct down-draft kilns at once. We have eleven acres of good shale ground, our clay bank being 30 feet high over the level. We have a switch track into our plant and good paved streets for city delivery, as our property is within the city limits. The market here is very good at the present time, with prospects that the same conditions will last for a long time, as there will be considerable new substantial brick buildings constructed this season, and the demand for brick streets has been in excess of the supply of brick for several years, and we have no trouble to dispose of pavers, as the people of this city know a good thing and want brick streets to the exclusion of almost all other materials.

The prices for different grades of brick at the present time are as follows: Semi-vitrified dry press, $16 per 1,000; No. 1 front, $16; No. 2 front, $14; select reds, $11; hard brick, $7.50; light reds, $7; salmons, $6 to $6.50; merchantable, $7.25; No. 1 sidewalk, $9; No. 1 pavers, $12; No. 2 pavers, $9.50.

Wishing your worthy publication the best of success, we are

Yours truly,
The Benkendorf Brick Company.

Good Prices Prevail in Canada.

Editor Clay-Worker:

Please send me The Clay-Worker for another year, for which I inclose $2. I have no photographs of my works, but may have one the next time I write. My place is but a small plant, but hope to have it a larger one some day. Business has been very good. I have sold all the brick and tile I made last season. Three-inch tile sell for $15 per thousand and A1 brick sell for $18. Soft brick sell for $7, and there is a good demand for tile. I am thinking of making 75,000 tile next season and 200,000 brick.
Erik J. Eriksen.

Quebec, Canada.

A Varied Experience as a Burner.

Editor Clay-Worker:

Enclosed find annual subscription. I may say that I am not very busy at the present time. I am foreman burner of the American Sewer Pipe Works at this place. They have two very fine plants here, and I am sure make as fine pipes as are made in the combine. They have two foremen, one at each factory, to see that the pipes are properly finished, and I see to the burning at both places. They have twenty-two kilns here. I was brought up with T. & M. Craig at the Hilhead works, Hilmarnoca, Scotland, and have burned enamel brick, bath sink pipe, etc., at Staffordshire, Yorkshire and on the Tyne, in north England.
W. S. Brown.

Pennsylvania.

All The Essentials for a Successful Venture.

Editor Clay-Worker:

I am in receipt of yours of recent date, and will now comply with your request made therein. First, please find P. O. money order for subscription to The Clay-Worker, in which I have become so much interested that I don't feel like having it discontinued, though I may never succeed in making brick or tile, I do not think I will regret the time spent in reading The Clay-Worker.

The trouble with me has been, that at the time of acquiring my shale and clay deposit, I knew practically nothing about clays, brick or tile making or about the machinery required in converting the clay into the finished product. Yet since receiving The Clay-Worker I have been a close student and I do feel that I know just a little about clays and clayworking machinery necessary to turn out the finished product.

I have enjoyed reading the proceedings of the N. B. M. A. Association and I have begun to feel quite an interest in the members and certainly feel them to be a noble, whole-souled, generous set of fellows and feel that I am deeply repaid by reading what they have to say and I also think that in The Clay-Worker they have a conservative exponent of their interest that they may well feel proud of, and if I could suggest anything for its betterment I certainly would do so.

The trouble with me has been, that while I have the clay and shale for making the finest of building or fire brick, pavers or pottery, yet I know practically nothing about the business, neither have I been able to close a deal with any one who does.

Now about the surroundings here, we are at a point, about 8 or 10 miles between the Ohio and the Mississippi rivers, 16 miles north of the city of Cairo, and this country has been a densely timbered district, timber being plenty and cheap, of course all buildings were built of wood. But things have changed, the lands have been cleared, lumber is scarce and high priced, so the people are looking for more durable and substantial material with which to build. Of course they naturally turn to brick as the most available material. Again about one-half of these lower counties are low lands, and if tile could be procured at a fair price, these lands would be tiled, and I believe that all the tile that a small plant could make would be taken direct from the yard by the farmers. As it now is, there is not a tile plant within 50 or 75 miles of this place.

The brick made here are made in Chester, Ill., shipped to Mound City, and sold here at a cost of $9 and $10 per thousand. With cheap labor, cheap fuel, and a market without competition a brick and tile plant would be a success. Now for fear of making this too long I will close. But send along THE CLAY-WORKER. J. L. ALDRED.

Pulaski, Ill.

Wants to Know About Setting.

Editor CLAY-WORKER:

Enclosed find check covering my subscription to THE CLAY-WORKER. I would like to ask some of your readers for directions (through the columns of THE CLAY-WORKER) for the setting and burning of brick, in an old fashioned, open top kiln, using wood for fuel. We have a brash, red clay, which is inclined to break in the yard, and we get a great many bats in the kiln. The clay is broken down at the bank with picks, water thrown over same, and it then goes directly to a No. 8 Brewer machine. The trouble is in the burning, and I will be thankful for some advice.

———, S. C. ALVIN ETHEREDGE.

Trouble from Cracking—What's the Remedy.

Editor CLAY-WORKER:

Enclosed find P. O. order for $2 to pay subscription for another year. The brick trade in Southwest Nebraska last year was good. Labor was scarce and wages high. i tried to make brick last year with an auger machine of 40,000 capacity. We run it at 30,000 per day. The bar of clay cracked on the corners as it came out of the die, we threw back nearly one-third of the brick and had to run the clay very soft to get any brick. When the bar got hard enough to handle good it would break in small pieces about four inches long, clear across the die, a side-cut die. We got two new dies last season. The clay is weak, the sand in it is very fine, the clay is easy to work. We put it through a ten-foot pug mill, then into the brick machine. The brick machine was bought ten years ago, was run two seasons, then lay idle seven years. If some reader of THE CLAY-WORKER can tell us what to do to improve our brick we will be very thankful.

WM. KAILEY.

The Spirit of Progress.

Editor CLAY-WORKER:

Enclosed please find $2.00 for my subscription for another year. I do not see how I could get along without THE CLAY-WORKER; it has been such a great help to me, and given me so much pleasure to read it. I want to get a few subscribers for the book, as I believe every brickmaker should have it.

I have been in Arkansas for some time and just recently returned. This parish seems to be waking up as to the brick business. There has never been much brick manufactured here, but as there are three railroads through the parish now, believe it will cause the building up of new towns along these new roads. We have a great variety of clays and shale here and I predict a good future for the opening up of the parish yards.

The weather is cool here for this time of year and the crops are backward. One consolation, we will have plenty of fruit, and our gardens are looking fine. Believe we will have a good crop year. H. LUDWIG.

————, La.

A Poor Year but Still Hopeful.

Publisher CLAY-WORKER:

Enclosed please find P. O. order for renewal of CLAY-WORKER for year 1904.

A year ago this time we were looking forward to the season just closed as full of bright promises. (That was about all we got.) There were many buildings contemplated and plans drawn; the building of which did not materialize, owing to the unsettled condition of the labor question. There were buildings started which were tied up for months owing to strikes and the general unsettled condition of labor prevented many more from starting. Of the many strikes inaugurated in the past year in the different lines of industry in this city, none, so far as I can recall, have been successful. We have on hand in this market at the present time, three or four times the quantity of brick we had a year ago. There was a new yard started up here last spring which helped to contribute to our reserve product. While our manufacturers have harmonized their interests and are working along the lines of brotherly love, the volume of business has been so small, they have good reason for feeling somewhat downcast, but hope for better things the coming year.

ROCHESTER BRICK AND TILE MFG. CO.

Happy Days in Canada—Brickmakers Never Too Old to Learn.

Editor CLAY-WORKER:

Dear Sir—Please find herewith $2 to renew my subscription to THE CLAY-WORKER. I should have attended to this before, but have been from home for some time, being at New Ontario, where I have some lumber interests, sawmill, etc.

I may say that I am more than pleased with your publication. I consider THE CLAY-WORKER a credit to the business, an indispensable visitor to the office of every worker in clay. I look for it with interest each month and read it carefully. Was very much interested in Prof. Orton's experiments and report on black core in brick, for I have had some remarkable samples of this thing the past season from a new bed of clay that we started using. I had no loss, but I found hundreds of brick (I am making almost wholly a building brick 6x9x12) that were black cored, but not out of shape or hurt in any way by it.

I should have attended your National Convention if I had not been called the other way at that time, and you may be sure that I read every item of the report with gladdness.

There never was a time since I have been in business (thirty-one years now in April) that business looked so good as it does now. There is a feeling of great confidence in our country for its great future. We think we see indication that Canada is to be the greatest country on earth. Certainly we have the territory and resources, and with confidence established we may go on to success sure; at any rate, we are having good times now.

We, as you may already know, have organized an association of brickmakers for Ontario, and will have a two days' session next year and hope it will be helpful to us.

For many years I was a subscriber to the Drainage Journal and am grateful for the excellent information it gave me, and now am very glad to have so good an educator as THE CLAY-WORKER, for though I have been a mud slugger for thirty years, I am still only a learner. This leads me to say that I have had more trouble in water smoking the past season than ever before, and almost came to the conclusion that I did not know anything, so I believe the brickmaker often feels.

Wishing you abundant success with your work.

Ontario. W. MCCREDIE.

A Quaint Answer to an Ad.

The American Blower Co., Detroit, recently advertised for a cook for the restaurant they have just opened up for the benefit of the fifty odd members of their office and drafting room force. Among the many applications received, one is so unique that they consider its humor worth sharing. It reads as follows:

"Detroit, Mich., Feby. 26, '04. City. Dear Mum: Please Miss I seed the advertisementn in the paper where you wanted one servant lady. Please miss is the work hard. I can't stand hard work, but I will do me best at it mum. I never was brough up in the city so I don't know much about cooking, but I'll do me best. Please Mum give me the job for I need it bad. I was married but my husband forgot me. Now ain't that a shame mum. However I feel this way ther are lots more thanks to the good Lord. Now Mum, I niver do any washing or hard work, but if its a lady your looking for Mum, I'm the one you want. Please answer this mum for its nothing I have in the world mum but your kind wishes for me welfare. Good by Mum. Ans. quick. Yours truly, Mary."

PATENT SUIT.

Suit was brought Feb. 23, 1904, against the Hamilton Brick Co., of Hamilton, Ohio, by the Horton Manufacturing Co., of Painesville, Ohio, for infringement of their patent on their Hercules brick machine. The Hamilton Brick Co. is using a machine made by the Arnold-Creager Co., of New London and Cincinnati, Ohio, and is called by various names such as "S. S. S.," the "New Century," the "Success," etc. 5 tf L.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

The BRICKMAKING SEASON OF THE YEAR 1904 began under rather more favorable conditions than for several years back. The weather did not allow getting ready to mold as early as some would have liked, being out of brick, and the shipment of several barges to the New York market reduced the stock under the sheds to a low point.

There is probably no line of business that is so elastic as regards the price, as that of common brick. One or two wet days is a factor to reduce rates, simply because then there are plenty of men to load boats and the result is a large fleet reaches the market at one time, the other fellow reaps the benefit by a reduced price, and the brickmaker is at a loss to account for the fall in price, when there is no one but who has done all in his power to bring about the reduced price.

THE MANUFACTURE OF BRICK

As a business is not like any other line of trade, that is, where New York is the market. Other lines keep going steadily unless there is a complete stagnation with but a restricted demand. The common brick trade of today is of only a few months' duration, and the more wet weather the shorter it is. Twenty years back, just so soon as the ground had dried enough to begin operation in the bank, stripping off the top soil, which was not used in the brick, rolling the yard and patching up the stops that had washed out during the winter, and all the other required work was done. Generally by the last of March the men would be working on monthly wages and the yards would be in full swing. They would run just as late in the fall as the frost would permit. Including the cleaning up in the spring and the overtime around the kilns the men would get in about eight months' work. That is all past and gone, not at all likely ever to return.

In those times there was not a combination of manufacturers to set a time to begin and when to stop, as has been agreed to in the last few years. Today the supply never falls below the demand, no matter what cause may come up to restrict output, there is always some left under the shed for the market in the spring. Last year it was a very late start and a very poor season for open yards and the cry went out that there would be but few brick under shed for the market. Still a meeting of the brickmakers fixing a date to begin molding on the 16th of May, which will make a very short season for the men on the yards, if a run of good weather should be in order during the following months, or if rain should prevail, the men will make a very short time. Probably not five months. How men with families can make a living in such short working time, and continue at the trade is beyond comprehension.

All of the meetings which have been held in the last ten years and some of them at a time when the tide of adversity was setting against them and had they adhered to their agreement it would have been of great help. Before the signatures of the manufacturers was dry, they had concluded not to adhere to what they had agreed to before their fellow members of the craft, and the buyers knew just as well as they were alive that the agreement would not have weight. And in all cases it was men who would have some weight in the business.

ONE GREAT MARKET

And that reached by water, makes brick trade like the farmer with his eggs all in one basket. A smash of prices may come at any time. It is a singular condition of the trade that one price does not rule through the season; there may be several drops in the rate, when the rates should be uniform for the straight article. If a commission man sells a cargo and says to the buyer that it is an A No. 1 load, when discharged it does not run so, there may be only a thousand light or off color, but enough to make a show. The buyer will on settlement insist on several thousand being called light and pay for them at that rate. The buyer has a very keen eye for brick which are not what he thinks they ought to be and will try his conscience to the breaking point to have you think they are not the quality he bought. The blame lies with the shipper, as the vessel which carries them is large and they make a good showing among so many of a dark shade.

There are a few yards on the Hudson which ship the best grade and they inform the commission men. The cargo is sold and turns out as represented and there is no trouble when the cargo is discharged and a receipt is given to the captain. As there is no place to sell the stock that comes on the market, the manufacturer is entirely in the hands of the dealers, so without concerted action among the manufacturers there will never be a uniform price. The man who turns out a good straight article has no trouble to sell, in fact, they sell themselves, but the man who does cull his brick, that is, if they need to be culled, in this day of advanced brickmaking, will succeed while others fail. When the brickmakers get together and pull together and keep their stock in their own possession under the shed and ship when they can be placed, there will then be good returns for the investment, and until then, it will one year pay some returns, the next hardly any; as in the past, so in the future.

SETTLEMENT OF THE STRIKE

Has caused an increase of permits for building, but on the whole not what was expected and a smaller class of houses seem to be the call, to judge from the total cost as compared with last year.

Total number of permits issued from January 1st, 1904, to May, 26, 1093; January 1st, 1903, to May 26th, 770, or a difference in favor of the present year of 323 permits.

The total cost of the 770 permits of 1903 was $38,499,815; the total cost of the 1093 permits of 1904 was $335,619,730, the difference in cost in favor of the 770 permits $2,880,045, which goes to show that the class of buildings must be smaller. The total cost of alterations from January 1st, 1903, to May 26th, $5,603,426. For the some length of time for 1904, $4,412,143. In favor of 1903, $1,191,283.

THE MARKET

Is in a fine condition and the brick manufacturers are feeling encouraged that it may continue to hold on for some time. Last month the price was on the down grade which is not pleasant to contemplate. With the labor troubles settled and the consumption of brick on the increase, and old stock being pretty well used up, it caused a stiffness to come over the anatomy of the brickmaker, that they would have it going their way, and present $7 and $7.50 is the ruling rates with poorer grades quite up, as the result of the high rate for better quality.

A. N. Oldtimer.

An Old Yet Aggressive Fire Brick Concern.

One of the oldest fire brick works in America and probably the one longest in continuous operation, and having the widest reputation for the excellence of its products, is that at Mount Savage, Md., operated by the Union Mining Company. The Mount Savage Clays were used as early as 1837 to line two blast furnaces that were located there. The present works were established in 1841 on the site of a rolling mill that made the first railroad rails in America. The plant comprises two factories, one for making hand mold brick and the other for machine molded brick. A peculiar feature of the plant is the two gas-firing continuous kilns that have been in operation many years, the gas producers running on a track alongside the kilns. The plant is now being remodeled and equipped in a thoroughly modern and up-to-date manner. The engineering work, including complete plans and specifications for the improvements, is being done by W. D. Richardson, of Columbus, O.

A wonderful lighthouse lamp, which throws a light for one hundred miles in clear weather, is in operation in the Liberal Arts Building at the World's Fair. It radiates light by means of a newly invented method capable of producing the brightest light known. The light is produced by petroleum steam, a combination of air and petroleum vapor, the two being united under pressure to burn in a mantle.

Written for The Clay-Worker.

THE CHICAGO SITUATION.

AMONG OTHER THINGS that are stirring in the windy city just now is a merry warfare in which the value of brick as a material for sewer construction is at issue with that of concrete, and George P. Gubbins, "King" of the bricklayers' union is threatening Mayor Harrison and the city with legal attack on the flank and rear.

The job on which the question is raised is the $800,000 contract for constructing the new Ninety-fifth street sewer. President Lynch of the Board of Local Improvements had decided upon the report of Commissioners Erickson and Schilling that the sewer could be built of concrete at a fraction of the cost of brick construction, and that the concrete would be more durable.

Thereat up rose President Gubbins of the bricklayers and swore that he would compel the mayor to use brick in the construction of the sewer for the greater profit of himself and his "subjects." The sewer bricklayers, it is said, already have so much work on their hands that it would be impossible for them to complete the new conduit in less than two years, but in spite of that they hated like everything to see a nice fat $800,000 contract slipping away from them into the hands of the concrete workers. The city stood by its decision to build the sewer of concrete, and Gubbins and his followers are threatening to bring an injunction suit to prevent the city from using concrete construction.

There is considerable activity in building lines in the downtown district just at present and in the line of mercantile buildings generally. In speculative building, however, some note a halt attributed generally to conservatism in financial circles generally experienced during a national political campaign. Inquiries for loans are constant, however.

Another large downtown structure which is sure to go up, but which cannot be started until next year because of present leases which bind the property, is a sixteen or eighteen story bank building to be erected on the site of the present Bryan building, northwest corner of Lasalle and Monroe streets. The Northern Trust Company has purchased this block for $850,000 cash, and will improve the property with a $2,000,000 buliding. Razing the four-story block which for years has occupied the site will be started May 1, 1905.

Moulding Brothers have the contract for the face brick of the new Chicago & Northwestern railway station. This contract calls for about 500,000 brick. They also have the contract for the white enamel brick of the building being erected by the Otis estate at the southwest corner of State and Adams streets.

Charles C. Bonner and Company will furnish the pressed brick for the Home for Friendless Jews to be erected at Fifty-third street and Ellis avenue. This will take between 90,000 and 100,000. They will also furnish pressed brick for the new Roman Catholic Hospital in Englewood at Sixty-fourth and Harvard streets. The building will be large, having 200 feet frontage and the structure will require in the neighborhood of 250,000 pressed brick and 3,000,000 common brick.

There is in fact a considerable boom on in building just at present. The total number of building permits issued last week was 138, at an estimated total cost of $1,664,700, and the week previous was 166, at an estimated total cost of $3,506,550. A building expert points out that structural iron and steel are cheaper than they have been since 1897, orders having been placed recently for 8,000 or 9,000 tons at $50 a ton with a guarantee of prompt shipment and completion of the work within ninety days. Skilled labor is also plentiful. On the other hand common brick are rather high, but this fact if it has been of effect at all has been so only in case of small structures.

The tie-up of building, sidewalk and paving contracts caused by the strike of the lime and cement teamsters, noted in the last letter, has been settled, the "closed shop," to the surprise of many being one of the concessions granted the strikers. As a matter of fact, however, the teamsters union is so inclusive that that provision need not have been stipulated to have been effective.

Scribe.

Chicago, June 14, 1904.

Written for The Clay-Worker.

ST. LOUIS BRICK AND BUILDING NEWS.

BUSINESS IN THE brick and terra cotta line has increased materially during the past few weeks. More bricks are being sold and many inquiries are being received by the brick makers. Several large contracts for big buildings and warehouses have also been closed. Conditions for business are decidedly better at present than they have been for some time and everything points to a nice brick trade in the near future. A contract to furnish three million brick for the construction of a large sewer was let a short time ago. There are a great many small houses under construction in the west end and a great many more will be started within the next few weeks.

Prices of brick still remain the same as they were reported last month. The decline in prices on some grades are still in force. Merchantable brick is now $7.25. Strictly hard and red is $8. Ordinary hard and red is $7.50. Front red and stock is $18 and sidewalk and paving $10.

In the vicinity of Centerville, Ill., a 4½-foot vein of potters' clay has been discovered.

Recent bids from contractors on building construction are in most instances considerably lower than at any time during the past year. The drop in prices is attributed to a feeling on the part of the contractors that the cost of labor and material has reached its height for some time to come, and that any change in the future will be a decline rather than an increase. It is this feeling of certainty for the future, rather than any slump in the prices of labor and material, which makes contractors more willing to get down to close figuring on work.

As to the cost of materials, lumber and brick have dropped five per cent. in the last month. The planing mills are finishing up the Fair grounds work, and are more keen and better able to handle new business than for some time past. Structural iron prices are already considered reasonable and no early change is looked for.

The wage question is still holding many back on new building. Prominent contractors interviewed, hold to the opinion that no marked drop in wages is likely and that good mechanics, with the exception of a few lines, will continue to receive about the same wages as heretofore. They are, all of them of the opinion, however, that the labor problem is much less vexing than formerly, in that good workmen are more plentiful, and that a full day's work is now possible. The building done is principally in the west end and includes several large business and apartment houses.

The Board of Public Improvements recently accepted quite a number of street ordinances and they were sent to the Municipal Assembly to be passed upon. The plans as submitted include a great many streets that will be paved with brick.

The monthly report of the Building Commissioner shows an unusual increase in the number of small buildings erected as compared with May, 1903. Last month there were 555 permits for building and repairs at an estimated cost of $864,212. In May, 1903, there were but 283 permits issued, yet the estimated cost of the work to be done was $804,580. A year ago there were permits issued for 91 new brick buildings to cost $633,657, and 162 new frame buildings to cost $45,604. Last montth there were issued but 116 permits for new brick buildings at a cost of but $626,585 and 252 permits for new frame structures to cost $96,465.

A. Saint.

The property-owners of Trenton, Mo., are circulating petitions for vitrified brick paving. There is no paving in the city at the present time, and a start may mean a good deal of paving there.

The Aregood Construction Company, 409 Chamber of Commerce Bldg., Chicago, write that they now have ready a new catalogue of the Aregood Brick and Tile Dryer and will be pleased to send a copy to every reader of the Clay-Worker who will ask them for it.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

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CURRENT COMMENT.

Speaking of artistic work in artificial stone, what's the matter with terra cotta? We all know that will stand the ravages of time.

* * *

What is the lowest per cent. to which you can reduce your waste at the brick kiln, and can you reduce it till it costs more to save the waste than the waste is worth.

* * *

The clay brick has been too long an important part in the builders' supply business to be easily separated from it now. Hence there is no need to fear reasonable competition.

* * *

The flower pot is a cheap clay product, but if they were all counted about now they would represent a big pile of material and a big industrial factor, for their very cheapness does much to make quantity.

* * *

The waste material from clay works, that is the burned clay in the form of broken brick, etc., when crushed makes one of the best road materials going. It makes less dust of the light flying variety and develops less mud after rains even than crushed stone.

* * *

The greatest clayworker is not always the man that talks the most about what he can do, nor is he always the man that makes the most money out of the business, for money making is a business proposition. The greatest clayworker is the man that gets the best results out of the material at hand.

* * *

We have discussed quite freely the make-up and the various features of the modern brick plant, and now it would be interesting to turn around for a minute and look at the other extreme and see just how small an equipment a man could start in with and make brick. It would at least be a reminder of olden times, and might suggest possibilities for clayworking in out-of-the-way places.

MISTAKES IN FIREPROOFING.

While the world "do move," it sometimes appears to move very slowly. For several years past THE CLAY-WORKER has called attention to the fact that in common practice the under side of steel beams is inadequately protected. Now we have brought before us information emanating from the National Board of Underwriters a requirement of only two inches of tiling on the underside of structural beams. The regulation of the best building laws is three inches. That the tension member or tension part of a beam should be less well protected than any other part is absurd, indeed. The web of the beam usually has the full protection of the depth of the fireproofing and where that is not true a width exceeding that by two or more inches of the bottom or top flanges of the beam. Nothing could be more destructive to a good building than a careless representation such as we have named coming from the underwriters' organization. They specifically state and require for standard fireproofing that the insulation be greatest where it is least needed, and least where it is most needed.

N. B. M. A. AT THE WORLD'S FAIR.

In response to the suggestion that a midsummer meeting of the N. B. M. A. be held at St. Louis the first week in July, so many of the members have requested that that occasion be deferred until later in the year, stating that owing to the press of business they are unable to leave home now, it has been decided to postpone the meeting until the first week in October. In the meantime, many of our readers will visit the Fair several times, a few have expressed the intention of going every month, and so it is proposed that those who can do so conveniently, time their visits so as to be at the Exposition the first week in the month. By acting on this suggestion, visiting clayworkers will always find at least a few of the craft in and about the clay exhibit, and so the enjoyment of these occasional trips will be much enhanced, for where even a few clayworkers are gathered together, there is a good time, much conversation, and the swapping of valuable trade knowledge. Undoubtedly, there will be a goodly number of the workers of clay at the Exposition the first week in July, and of course they will make the Clay Industry Exhibit in the Mines and Metallurgy Building headquarters. If each one will register there on arrival, their personal friends will be able to meet them by appointment instead of depending on chance. The clay exhibits are now nearly all completed. The same is true in nearly every department of the Exposition. Those who attend now will find plenty to interest, instruct and amuse them, whether their stay be short or long.

OUR CLAY PRODUCTS OF GREATER VALUE THAN GOLD AND SILVER.

Every clayworker must be keenly interested in the chart on page 703, and the heart of the enthusiasts in the business, and their name is legion, must swell with pride when they contemplate the importance of the clay industries so graphically set forth. The chart and its story will be a surprise to many who are fairly familiar with the rapid growth of the brick, tile and pottery business, while to the uninitiated it will prove a revelation. How many are there who realize that the value of our clay products exceed that of the precious metals? Yet such is the case. The total value of the nation's precious metals, gold and silver, produced in 1902, is less by $12,754,531 than the value of our clay products for the same period. The latter totals $122,169,531, while gold only amounts to $80,000,000 and silver but 29,415,000.

Cold statistics arranged in tabular form are not apt to make the impression that a graphic exposition like our clayworker chart will, which shows at a glance the relative values of the nation's mineral products. The chart will certainly be among the most interesting and instructive exhibits at the great World's Fair. The showing is so gratifying that many of our readers may wish to exhibit it to their friends and patrons. The best manner of doing this is to have a replica of the chart, similar but larger than the plate on page 703, framed for use as a wall ornament. In that form it will make a fine appearance and be a most appropriate decoration for the office of every clayworker who takes a just pride in his work. These enlarged replicas of the chart will be furnished, ready for framing, and mailed in tubes, postage prepaid, for $1.00 per copy. The chart so displayed in the office of the leading clay manufactories of the country will proclaim to the world at large more eloquently than words, the importance of our clay industries and the value of our clay products, and so prove a useful as well as a pleasing reminder of the greatest industrial exposition of modern times.

AN OBJECT LESSON.

In this age of specialization we are liable to go too far when we once get started. The idea of special education, special application, self-centeredness or singleness of purpose may be carried too far. In one of the great newspapers of the country a series of articles has been running which are written by so-called successful men, one the manager and large stockholder of a wholesale dry goods house. He says the young man who is successful should think about nothing else than his business and that he can tell when he sees a young fellow working around the house whether or not he has been out the night before to fill a mere social engagement. He can tell by the way he piles the goods or the way he handles them if he has any other thought in mind than the work immediately before him. This merchant says that the young man, in order to be successful, must cut out all social engagements, that he must use his days and nights for business alone, that the price of success is concentration, application, singleness of purpose. Another article on this same subject has been written by a banker and he says exactly the same thing, excepting that he writes from the inside of the bank while the other writes from the wholesale dry goods house. But is it success that is worth having that grows out of this sort of application? And whatever it is, is it worth having? A book has recently been written on Andrew Carnegie by Mr. J. W. Bridges. This book was written from Mr. Bridges' point of view and not that of Mr. Carnegie. When this book first came out it was sold for $100 a copy, because it was supposed to contain some pretty startling things about Mr. Carnegie; but after the market was worked, the price was cut down to $2. Now the world at large may buy it. It does, no doubt, tell a great deal of truth about its subject and it does make it appear that Mr. Carnegie could see his side of a business proposition much better than he could the other side. But there is an element in his character which it is well for the rest of the world to know. From a negative point of view it relates to this question of specialization all during his successful, active business career. Of all things Mr. Carnegie was least a specialist. His letters were clumsy and disjointed, he knew little, and cared less about details than any one can well conceive. He had what appeared to be an awkward way of touching the large things, but "somehow" he was always able to reach. He was very seldom near his offices or works, and there were weeks at a time when he was where he could not be reached, but he had the broad touch. Of course, the kind of men he wanted around him were the specialists. But even among them, those occupying the highest positions were not men who had been trained by drawing them through a technical hole. Technical and special education are the outgrowth of the spirit of the times. But along with them, in order to secure permanent success or a fair measure of happiness, there must be broad culture and general knowledge. The nation which depends for its upbuilding and establishment upon the effort of a large number of people working from a single, a self-centered, one idea point of view must, in course of time, find itself without cohesion.

TRADE LITERATURE.

THE OHIO GALVANIZING & MFG. CO., Niles, Ohio, have out an attractive leaflet telling of the merits of 'Ohio" pressed steel brick pallets which are especially adapted for steel rack dryer cars. These steel pallets are the up-to-date pallets and are made in a variety of styles and sizes to suit the needs of the manufacturer. Write them telling them what you need or would like, and they will gladly quote prices and give information wanted. See ad on page 765.

CHICAGO RETORT AND FIRE BRICK CO., Chicago, Ill., whose main office is at Forty-fifth and Clark streets, has a diminutive poster on which is shown a section of a brick and tile kiln clearly drawn so as to illustrate the method of using their fire brick of special shapes for kiln construction. They will be pleased to send one of these little posters to any one who will write them for it. They can also give much valuable information on the subject of kiln building.

W. E. CALDWELL CO., Louisville, Ky., has out a new catalogue illustrating their high grade water tanks, towers and tubs. It is a book of forty pages and contains much valuable information touching on the very important matter of water supply for factory use, on which they can speak with authority, for they have made a specialty of it for more than a quarter of a century. Every manufacturer who contemplates the building of a new water tank or the replacing of an old one should first of all write for a copy of this interesting book.

RICKETSON MINERAL PAINT WORKS, Milwaukee, Wis., has published a neat little folder, presenting a number of new testimonials from people who use their mineral colors. Among them are a number of brick manufacturers who testify to the merits of Ricketson's colors, a small quantity of which added to the clay or mortar adds immensely to the color of the brick or brick work. If, Mr. Brickmaker, you are suffering from pale brick, write to Dr. Ricketson for his prescription. A postal card with your address will bring it.

ARTHUR KOPPEL, New York, N. Y., has just issued Supplemental Catalogue No. 77, announcing that they have taken the selling agency for the Baldwin Locomotive Works and are now prepared to furnish the famous Baldwin locomotive of all classes and sizes, and for any gauge, narrow, as well as standard, and for all kinds of motive power, steam, electric, or compressed air. The catalogue contains a number of illustrations of various types of locomotives. These they can now offer the trade of any desired size and capacity. They will be pleased to send this new catalogue to any of our readers who will write them, mentioning The Clay-Worker.

THE ARNOLD-CREAGER CO., New London, Ohio, has issued a new catalogue of brickmaking machinery and brickmakers' supplies which contains some novel features, notably some original brickyard verses. The first stanza reads:

"In days of old, when knights were bold, to make bricks then was labor;
But easier came those brick to mold, we'll tell you how, good neighbor."

The reader who craves this knowledge must write for a copy of the catalogue, in which he will find other instructive and entertaining matter in the form of cuts and descriptions of clay-working machinery of all kinds from clay tempering wheels to up-to-date- brick machines. A copy can be had for the asking.

THE LACLEDE FIRE BRICK MFG. CO., St. Louis, Mo., has favored us with a handsome brochure—a key to a pleasure trip at the World's Fair. It is in fact an invitation to all clay-workers who visit the World's Fair "When weary with endless attractions of the great Exposition," to seek diversion by visiting their offices and factories where a well-appointed staff will be at the visitor's service to attend every personal want. With the brochure is a large map of St. Louis on which is indicated the location of the Laclede plant—a few blocks only from the Exposition grounds—and also a map of the Exposition showing the location of all the principal buildings, the various entrances, etc. Any of our readers who are now planning to visit the Fair and have not received a copy of this brochure will be accommodated on addressing the L. F. B. M. Co.

THE JEFFREY MFG. CO., Columbus, Ohio, is mailing a supplement to their "Century" Rubber Belt Conveyor Catalogue, which is handsomely and effectively illustrated. Evidently these conveyors are adapted to all purposes, sand clay, brick or what not. They have also issued a supplement to their locomotive catalogue, which describes and illustrates their electric locomotive for gathering purposes. They will be pleased to mail same to any of our readers, and give expert advice on any conveying proposition.

THE J. D. FATE CO., Plymouth, Ohio, are presenting their friends and patrons with something new in the way of a portfolio of their brick and tile machinery. It contains twenty-four 12x18 inch sheets of heavy coated paper, each showing one or more excellent executed half-tone engravings. These are bound together with a silk cord between covers of dark green paper on which the firm name and address is printed in silver bronze, with striking effect. Those of our readers who have not been remembered are requested to notify The J. D. Fate Co.

COUNT YOUR BLESSINGS.

By M. C. Meigs.

Who sends the sunshine and the rain,
The flowers, the fruit, the grass, the grain?

Who made the forest and the plain,
The mountains and the deep blue sea?

Who forged this never-ending chain
Of blessings for humanity?

Who, in season, sends the snows?
Who sends the labor and repose?

Who stored the coal, the oil, the gas,
The gold, the iron and the brass?

All gracious gifts for you and me;
Ungracious race, Humanity.

YOUNG AMERICA.

Oh, boys, aren't you glad you're American-born,
As free as the beams that illumine the morn,

With American sun and American skies,
And American courage and chances to rise?

For American brawn and American brain,
For American rule and American reign;

For American grace and American glow,
For American grit and American go;

For American beauty and American brothers,
For American men and American mothers;

For American colors to wave o'er your head,
So bravely defended by Americans dead;

For American wages and American worth,
Look up and thank God for American birth.

Yet with all of her blessings there is still a long list
Of American evils, God help us resist!

The machine which does not answer your purpose may be just what some one else needs. Tell the "needee" about it in a card in the "For Sale" columns of THE CLAY-WORKER.

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IF YOU PAY a high price for plans and rights of a patent kiln or furnace, that may or may not be adapted to your conditions, it must be that you do not know that I furnish better designs for less money.

WILLARD D. RICHARDSON,
Consulting Engineer to the Brick Industry.
See pages 758 and 763.

WANTED, FOR SALE, ETC.

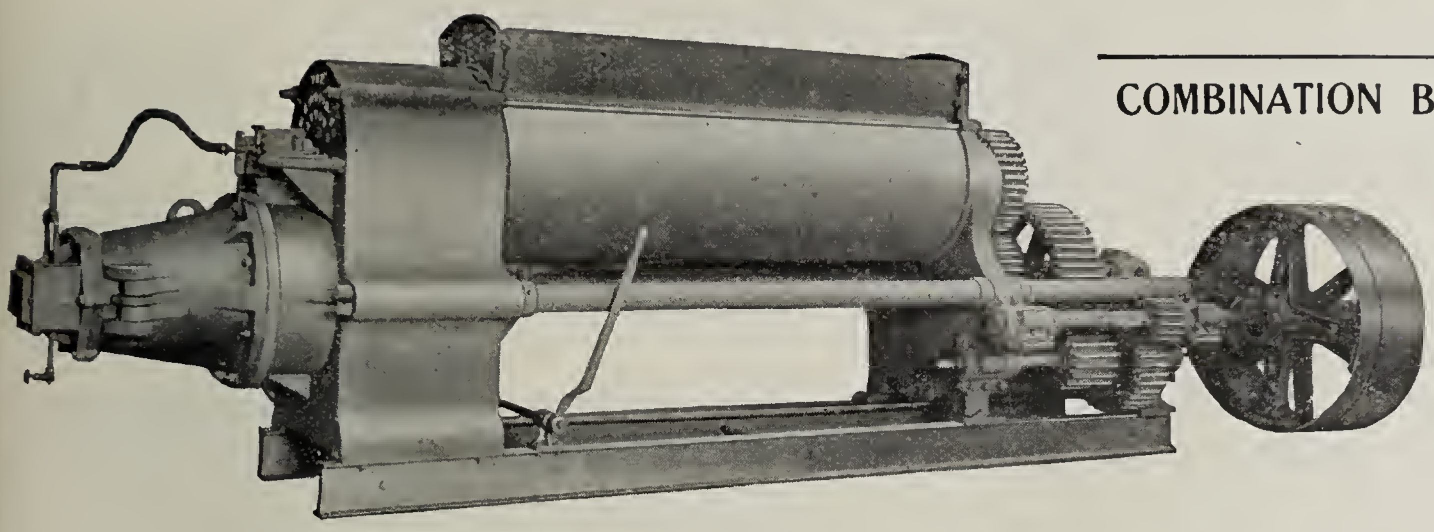
FOR SALE CHEAP.

One United States Four-Mould Dry Press, one pulverizer, elevator, shafting, belting, etc. Address
J. & J.,
6 2 d Care Clay-Worker.

FOR SALE—One second-hand Hercules Brick Machine, Hercules Double Roll Crusher and a quantity of wooden brick pallets, in good condition, 10x34 and 10x32. Red Star Brick Co.,
5 1 d Warren, Pa.

FOR SALE—90 h. p. engine and 70 h. p. boiler, A1 condition. Cheap. Located in West Virginia. Address
TYGARTS VALLEY BRICK CO.,
No. 8 Prince Karl Apartment,
5 1 cm Washington, D. C.

For Sale, Wanted, Etc., Ads Continued on Pages 752-755.



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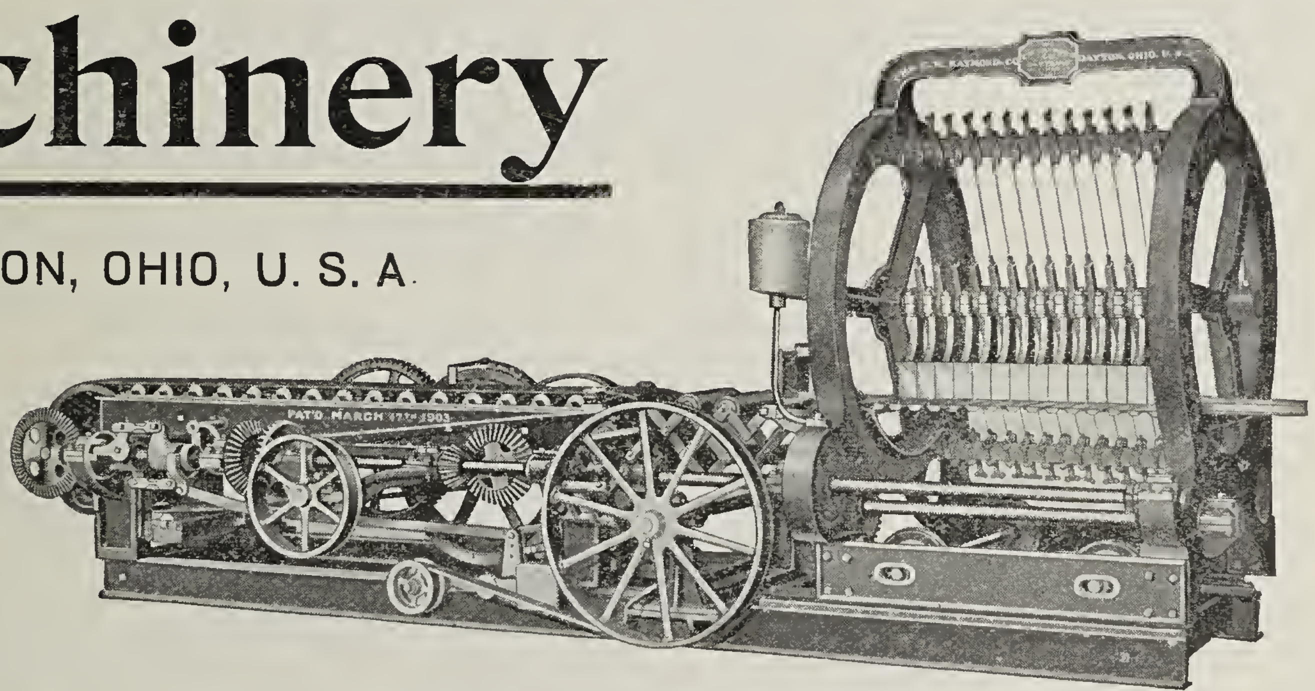
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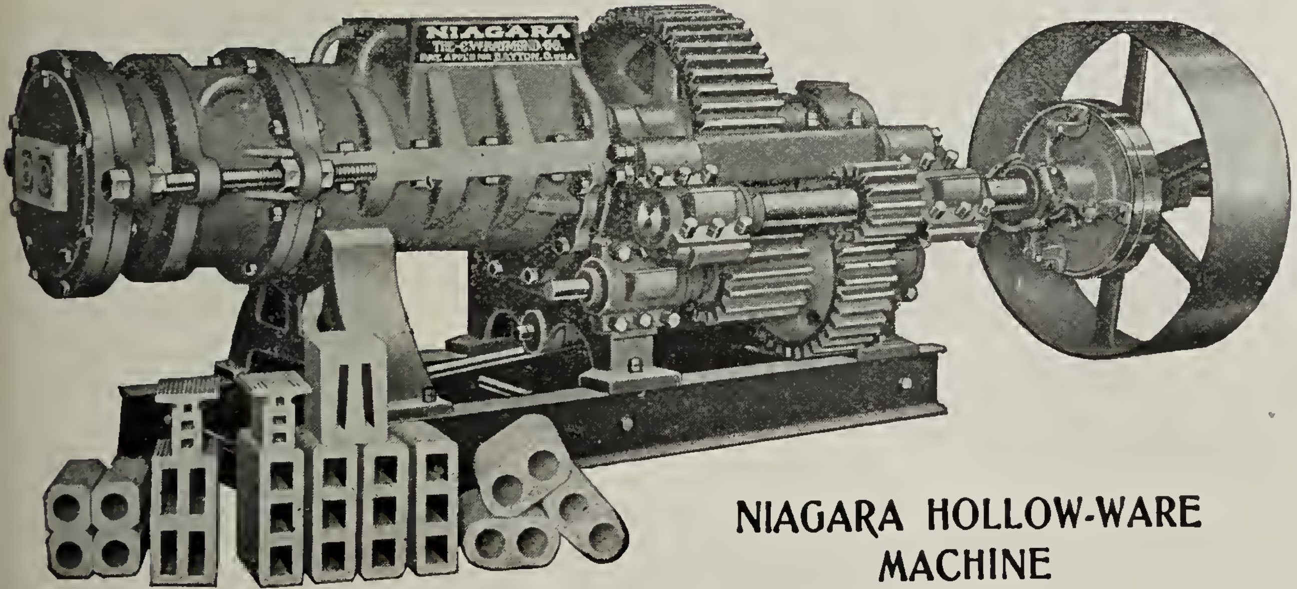

NIAGARA HOLLOW-WARE MACHINE

Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Written for The Clay-Worker.

DOWN IN JERSEY.

DURING THE PAST few months M. A. Edgar, of Perth Amboy, a large shipper of clay, both from the north and south sides of the Raritan River, has built a factory for the manufacture of fire brick at his clay mines just west of the Ostrander plant. I had the pleasure of visiting this new plant a few days since, and found some old acquaintances there. first of all, Mr. Wilson, who has been bookkeeper for Mr. Edgar for a long term of years. Mr. Wilson looks after the shipping of clays, which has always been the chief industry at this point. In the office we were introduced to Dr. Emmons, who is the superintendent of the brick plant. Mr. Emmons is a new acquisition to the brick industry, so I am told, but seems to be a pusher. After a pleasant chat at the office we walked over to the factory and here found an old acquaintance, Stacy Tuttle, who has charge of the manufacture of the brick. Mr. Tuttle has been in the clay manufacturing business for seventeen years that the writer knows of, first with the Perth Amboy Terra Cotta Company, then with the Staten Island Terra Cotta Company at Spa Springs under Robert Lyle's administration, next with Mr. Lyle at the old Isaacs plant on Raritan River, and more recently Mr. Tuttle was in the City of Mexico looking after the sewer pipe plant located there by Robert Lyle and his associates. But, like all Jerseyites, either by birth or adoption, we gravitate back to the beauty spot of the East. Of course, all these years have brought many changes, as well as gray hairs.

Well, after greeting Mr. Tuttle, we took a look at the brick plant we started out to see. Here we found, to our astonishment, the old, old method of mixing clay, viz., the big old-fashioned wheel running in a large circular pit—yes, two of them. There were several wet pans outside that looked as though they had never been used. Upon asking a few questions, we were told that for thorough mixing these wheels did the best work. The clays are thoroughly mixed, then placed in a heavy Henry Martin soft-mud machine and molded in the rough, then, after partially drying, are repressed by hand and burned in two large, round down-draft kilns. A new square down-draft kiln is to be added at once, as the two kilns now on the ground are not capacious enough. Ten thousand brick a day is the capacity, but with the clay right at the back door of the factory, with both river and railroad transportation, Mr. Edgar should be in good shape to compete with any one else in the fire brick line.

Steam is furnished by two large boilers both for engine and dryer.

Mr. George Liddle has charge of the mining of clays, and has filled this position for many years. The past winter was so severe that very little clay was mined or shipped. The Ostrander plant just east of Edgar is running, and we noticed being erected along the railroad north of the latter factory quite an extensive affair for transferring clays and sand. This consists of a cable transfer with a stretch, I should say, of almost 1,000 feet. The power consists of a large portable boiler and a large hoisting engine. The idea is to transfer clays and sand in buckets from the pits to the cars without the use of horses. This arrangement is being erected on ground covered with timber only a few years since. If this transfer works successfully it may lead to more arrangements of the same kind. We noticed at the Edgar factory one horse hauls two cars loaded with four tons of clay each to the river to be loaded on vessels. This is cheap transportation, as the trip is about half a mile and a horse can haul many loads per day.

Down the river below Ostrander's is the old-new factory first erected by Dr. Goodrich, who owned very rich clay beds and made brick years ago, but the plant was dilapidated and about a wreck when Mr. Isaacs bought the property last year and proceeded to put it in shape to manufacture hollow brick. Several new kilns have been built, but the plant has not yet started to manufacture brick. Weber's, of course, run all the time on fire brick and gas-retort work. Colonel Weber, who has charge of this plant, resides in Metuchen in a beautiful home made of—wood, but as he purchased it after it was built, of course the Colonel is not to blame for the non-use of brick.

At the old Keasby factory, now owned by the National Fireproofing Company, we find a new factory in place of the one that stood so many years. The new buildings are of steel and conduit blocks, or what is locally known as "seconds." These blocks are certainly an excellent building material and should stand forever.

We found our old friend, Victor Main, in the office here, also Mr. Ferd Hall. Mr. Main now has full charge of this factory. We had a pleasant chat with these gentlemen, but as "the powers that be" have an antipathy. so we judge, to some one, we did not ask to go inside the new factory to inspect machinery, etc., but hope later on to be able to give your readers a full description of the new plant. All of the factories of this company were shut down during April, but are running again now, except the old Lorillard plant at Keyport. We noticed at the old Keasby plant a small locomotive is now used as motive power to haul clay instead of the immense fat white horse and the man with big whiskers formerly employed for this purpose. We have not thought to ask who is the immediate manager of the plant immediately east of this and formerly managed by Robert Lyle. We believe, though, this is also owned by the National people. The old Pardee plant comes next. This also has been rebuilt since the fire a couple of years ago, all of brick and steel. Mr. James Rossi is the local manager for all these plants, including the Lorillard plant at Keyport. The old Florida Grove property has been added to this property and clay is now being taken from this by small railroad to factory.

The old tile plant is in full operation under the management of Mr. Metzner, who also lives in this beautiful village of Metuchen. We notice two new kilns at this plant, with quite a large kiln shed over same. We understand the tile turned out at this plant is unexcelled nowadays. This is the last clayworking plant on the Raritan River above Perth Amboy.

At Maurer's immense plant we still find at the helm Mr. John Phieffer, who has held the reins as superintendent many years. Many changes have been made at this plant in the past two years. Some large additions have been made to the buildings, all of steel frame and hollow block filling, with tile roofs. Our old friend, Mr. Liebaugh, still looks after this part of the work.

Mr. Phieffer is now also alderman-at-large of the city of Perth Amboy.

We neglected, by the way, in giving a description of the many industries in Perth Amboy, to mention Roessler & Hasslacher's Chemical Works No. 2, which is built on the old Hall Terra Cotta Works site, immediately across High street from the Perth Amboy Terra Cotta Company's plant. This whole block has now been built up with substantial brick buildings.

I should also have mentioned the fact that the old Standard Terra Cotta plant and the New Jersey Terra Cotta Works are both prospering. A plant is also being erected in the outskirts of the city for the manufacture of cement blocks for building purposes.

There are now many buildings under way in the city and plans are about finished for the new Government Building. In fact, Perth Amboy and the vicinity is fast forging to the front as a manufacturing center and has had a wonderful growth in the past ten years. A new $35,000 brick school building was finished last season, and the children come so fast that about $40,000 more has to be spent this year to accommodate the waiting crowds. Surely our future President has no room to complain of small families from this neck of woods. W. R. O.

The Lizard Creek Brick and Sand Company have organized and will build a plant near Ashfield, Carbon Co., Pa. It is rumored that they will equip with dry press machinery at the start, and later will add an augur machine outfit.

THE VICTOR RE-PRESS

Do You Re-press your Brick? Do you give them the smooth surfaces, the square corners, and keen edges necessary to make a high-class brick? Do you recognize the worth as an advertisement, of your distinguishing imprint upon each brick? All these advantages can only be had by re-pressing. Re-pressing enhances not only the beauty of the brick, but their utility and sale value. The Victor has attained an unequaled distinction and had a phenomenal sale for this class of work. Its advantages and conveniences are so manifold, as to place it in a class by itself. The first machine that meets your eye on a well-equipped brick plant, is a VICTOR RE-PRESS. IT IS A MONEY MAKER AND A MONEY SAVER

Raymond Victor Re-Press

We equip plants complete
for Building, Fire
or Paving Brick
making the most liberal
guarantees as to the efficiency of our machinery.
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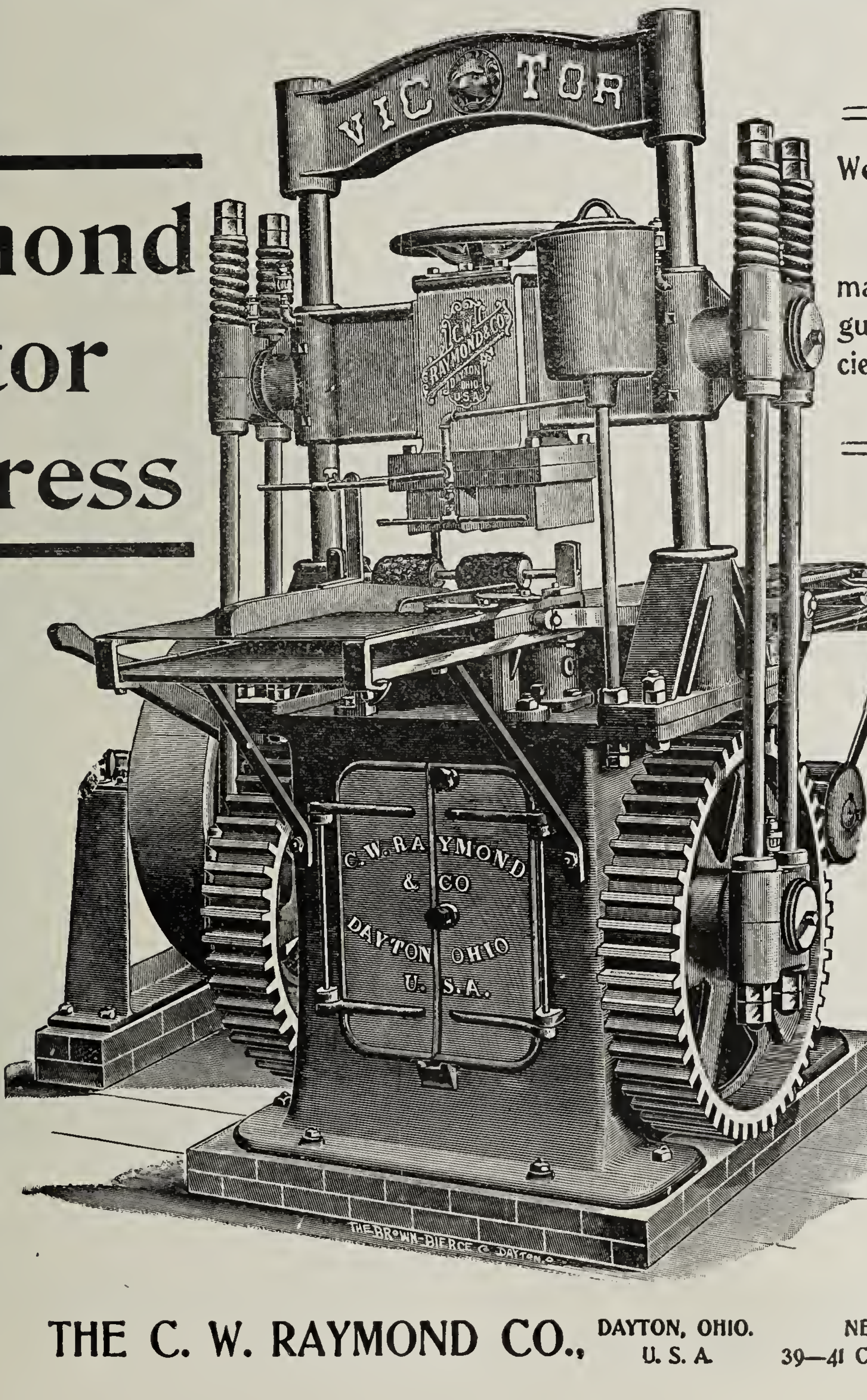
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THE BROWN-BIERCE C. DAYTON, O.

THE C. W. RAYMOND CO., DAYTON, OHIO. U. S. A.

NEW YORK OFFICE
39—41 Cortlandt Street, Room 40

Written for The Clay-Worker.

NORTHERN OHIO BRICK AND BUILDING NEWS.

THERE is no marked change in the brick situation in Toledo and northwestern Ohio from that of a month ago. All the plants are running and accumulating a surplus stock, the demand being less than the supply. All the brickmen in general speak rather discouragingly of the situation and are not expecting any real great rush in the business this season. The usual springtime rush did not put in evidence as expected and the mid-summer slack is already noticeable.

Architects and contractors, however, have been living in great hopes that there would be great activity in building. While there are a number of big jobs under way, this number is far below that of other years when great building activity was in evidence. The bulk of the building which has been going on during the spring is in most part represented by small buildings, such as cottages and additions. Many buildings have been contemplated and the architects have been kept busy, but many of the projects have not materialized. The fact that there have been so many projects on tap throughout the entire spring months had a strong tendency to make the architects of the city the most hopeful set of fellows to be found anywhere. The high price of labor and material, together with the usual depressing effects of a presidential campaign year, all have been and are strong tendencies to bring about discouragement.

The litigation over the legality of the appointment of the city building inspector has also had a tendency to delay much building. The matter has been in the hands of the Common Pleas Court for the past few weeks and will in all probability be settled before the end of the month.

Returns to the county auditor just recently completed show a total of of 1,159 buildings to have been erected during the past twelve months. The total taxable value of the new buildings is within a few thousand dollars of the million mark.

The number of permits issued by the city building inspector for the month of May was 155, about the same number as the previous month. It was expected there would be a rush for permits in June, but thus far the boom has not shown up. The anticipated rush may come with the decision of the court in sustaining the legality of the appointment of City Building Inspector Hudson. There is little doubt that quite a number of contracts for building have been held in abeyance in the hope of escaping the permit fees.

The Toledo Board of Education is contemplating the expenditure of about $85,000 in additional school buildings. It is proposed to add four rooms to the Chase school building, four to the Ontario building, two rooms for Industrial Heights, four rooms to the Detroit building, four to the Hoag building, six to the Glenwood building and six to the Spring-street building. There are movements on foot for many alterations and other improvements, and, if the proposed plans are carried out, there will be a lot of work for the successful contractors. In most of the above improvements brick will enter very largely into the construction of the buildings.

The Toledo lodge of Elks has decided to erect a handsome building on Michigan street opposite the Lucas County Court House. The structure will be three stories and will be built of brick at a cost of about $50,000. The plans are being completed and bids will probably be received within the next few weeks. The building committee is composed of William Bellman, W. H. McFarland, J. H. Pheat, P. A. Garrigan, W. H. Haskell, L. E. Flory, W. M. Godfrey, W. M. Kelley and M. B. Daly.

Dr. A. T. Barnum is having plans drawn for a flat building which will cost about $80,000. The flats will cover ground 250x150 feet in dimensions and the building will be four stories high. The structure will contain 25 seven-room flats, making 175 rooms in the building. The building will be erected this summer.

A. E. Macomber, of A. E. Macomber & Co., brick manufacturers, is having a brick and frame store and flats erected at the corner of Jackson and Union streets at a cost of $3,000.

Some building activity is reported from points outside of Toledo. Dr. J. H. Wilson, of Bellfontaine, O., has let the contract to Bellefontaine contractors for the erection of twenty modern dwelling houses.

W. J. Spear, of Toledo, has been awarded the contract for the erection of a new public building at Richmond, Ind., to cost $58,350, the work to be completed by March 1, 1905.

A Carnegie library building to cost $20,000 will be erected at Bucyrus, O. The structure will be of white pressed brick with stone trimmings.

Paving legislation for fourteen streets has been presented to the city council of Toledo. Very little of this work, if any, will be completed this season, but with the legislation passed up to the point of letting the contracts, great headway will have been made for the work for the spring of 1905. A number of streets are now being paved, but a number of the large contracts are being held up by the Board of Public Service on account of a change in the kind of material to be used. Considerable repair work is also to be made to a number of pavements during the season, among which will be Summit street, the main business thoroughfare of the city. Russell & Jennison have been awarded the contract for the paving of Grove Place with metropolitan blocks and have already begun work.

Marysville, O., will have three streets paved this season at a cost of $80,000.

As an aftermath of the coal strike last season, the Novelty Brick and Coal Company, of Toledo, was awarded a judgment of $596.10 against J. W. Copeland. Plaintiff sued to collect money alleged to be due on account. Plaintiff agreed to furnish defendant with certain amount of coal each day, but, the strike making this an impossibility, the contract was not fulfilled. Copeland refused to pay amount said to be due, hence the suit. T. O. D.

Toledo, Ohio.

IMPROVED TILE DIES AND A NEW BRICK PRESS.

Editor Clay-Worker:

Enclosed find check for the amount due you for my little ad., which is proving very helpful to me. My business is increasing fairly and steadily. During the last few months I have made dies for hollow blocks, radial chimney brick, and roofing tiles for a number of factories in different sections of the country. I find that the shape brick or hollow ware business is but little developed in this country. Manufacturers seem to think that it is much more difficult to make shapes successfully than is really the case. I am sure that many brickmakers might add this feature of the business to their line with much advantage and profit. The idea that chimney brick and hollow block must be made on steam presses or other special machinery is erroneous. This ware can easily be made on any auger machine, especially the smaller sizes. I have often wondered why there are not more flat tiles and interlocking clay shingles made in this country on auger machines. Many a small machine adapted to this work stands idle a good part of the season.

With the right kind of dies and a little care and patience, these machines will turn out good hollow blocks, etc. With a good cheap water lubricating die made with perforation bolts, a hollow block can be made easier than a solid brick. The success that I have had in introducing my dies so far encourages me to persevere, and I am confident of still greater success. I have also invented a new dry press brick machine which is being manufactured here in St. Louis and will be exhibited at the World's Fair. It is entirely different from anything now on the market; it is not so large and much simpler in construction. When you come to the World's Fair be sure and see it. I am sure you will find it interesting. Max Mueller.

St. Louis, Mo.

The Wabash

is the only line landing passengers at World's Fair Main Entrance. See that your tickets read via THE WABASH

For Particulars address

G. D. MAXFIELD, D. P. A.

INDIANAPOLIS, INDIANA

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE SITUATION continues unchanged in business in and about San Francisco. Building is active but not booming. The busiest people in town now are the plumbers and steam heatng men. Building contracts are coming in rapidly and the outlook for the entire summer is good. Building and improvement work are being carried on rapidly throughout the entire State, especially in Los Angeles and San Diego. At the last session of Congress $535,000 was appropriated for public buildings throughout the Pacific coast and $525,000 for five harbor improvements. Furnishing supplies for the Asiatic war is setting money into circulation in the export cities and a big crop outlook makes conditions good in every part of the interior. The building outlook for the coming season is good.

George Gray, of Gray Brothers, in the Haywards building, reports that trade will continue as it is now without material increase or decrease during the summer. Manufacturers of brick are pleased that conditions are as good as they are and Mr. Gray believes the outlook to be favorable.

The Steiger Terra Cotta and Pottery Works offices in the Mills Building are busy now on a large number of small contracts. They report that there is promise of a lot of work ahead and no danger of quiet times.

The Denney Clay Company, of Seattle, Wash., will soon move its plant from Van Asslet to Taylor street, where they will also construct a separate plant for the manufacture of sewer pipe, conduit tile, fire-proofing and similar products.

The principal contracts for the new wing to be built at the Highland State Hospital for the Insane at Redlands, Cal., were given to Taylor Bros. Brick Company. The firm not only secured the contract for the masonry and brick work, but also for the carpentering, plastering and the iron work.

The majority of contracts for sewer systems which are now being given out in San Francisco and adjoining cities are for salt-glazed, vitrified, iron-stone pipes.

J. B. Raine & Son, manufacturers of drain tile, common and repressed brick, located at LaBosla, Orange county, Cal., are now engaged in enlarging their plant. The company has just secured a contract for furnishing the city of Santa Ana with 25,000 repressed brick, to be used in the construction of a city hall. Three kilns of 4-inch tile are turned out every month.

The Corona Pressed Brick and Terra Cotta Company of Corona, Cal., is busy at present and report having a good lot of orders on hand. Among the most important contracts secured by this firm lately, are the following: 93,000 pressed brick for a firm in Riverside; 45,000 for a Los Angeles concern and two carloads of fire brick for Long Beach.

The La Bolsa Tile Factory, which was recently established at La Bolsa, Cal., has shipped its first car load of drain pipe to Tampa, Ariz., on an order from the United States Department of Agriculture for the purpose of demonstrating the benefits of tile drainage. The company is engaged in the manufacture of drain and irrigating pipe, brick and roof tiling.

Crowe Bros., brick manufacturers of Fortuna, Cal., are removing their yards from Fieldbrook to Eureka, where they will have more ground space. The output in the new location will be increased to 20,000 bricks per day.

The Washington Brick Company, whose plant is located on the water front at Tacoma, Wash., is soon to put in an elevator which will carry brick to the top of the hill, a distance of 375 feet. The elevators will be operated by electricity.

News has reached here of the valuable find of pottery clay on the Monte Paraiso ranch at San Jose, Cal. The clay bed is at an elevation of 2,400 feet and ranges in color from a dark brown to a light mottled gray.

The business men at North Bend, Ore., have raised $1,000 as a bonus for an eastern brick manufacturing concern to establish a plant on Kentick Slough. It is the intention of the manufacturers to use the $1,000 in the erection of an experimental plant and if this proves successful to erect a $250,000 plant.

Fire broke out last week in the brick manufacturing plant at the Penitentiary at Santa Fe, New Mexico, but was soon gotten under control by one of the convicts.

C. Forrester, who was awarded the contract for the brick work in the outfall sewer at Los Angeles, has been made defendant in an attachment suit brought by E. P. Johnson, Jr., Oscar Lawler, W. P. Jeffries, Brodie of the Brodie estate and Robert Wankowski to compel him to turn over the contract to them. The plaintiffs are members of a syndicate formed for the purpose of financially backing Forrester on the outfall sewer project, but what has led the syndicate to take such summary action is not disclosed by the attachment suit.

M. W. Findley, of the Corona Pressed Brick and Terra Cotta Company, of Corona, Cal., states that he is doing extensive development work on an immense ledge of white clay in the Santa Ana mountains, south of town. The clay is pronounced to be of fine quality and will be used in the manufacture of pressed brick and pottery ware. A tunnel has been driven 150 feet along the face of the bed. A Los Angeles Brick Company bought clay deposits along the Corona Company's beds and in so doing blocked the road of the Corona Company's supply. With the new clay ledge at its disposal the local company will have ample material of its own.

The Pioneer Sand-Lime Brick Company of Seattle, Wash., has been incorporated in that place with a capital stock of $400,000. The names of the incorporators have not been made public as yet.

Improvements are under way at the brick yard of the Holland Brick Company, Antioch, Cal., which will greatly increase the facilities for the manufacture of the product. Superintendent Muller will have charge of the work.

The Palouse Brick and Tile Company of Palouse, Wash., is now being organized for the purpose of manufacturing brick and tile. The new steam plant to be installed will cost about $5,000 and will have a capacity of 25,000 brick per day.

Messrs. Burns and Miller, of Wilbur, Wash., are preparing to establish a brick yard on the Thomas Connery place north of here, where some rich clay deposits have recently been discovered. Machinery for the work will be secured at once.

Fire last week destroyed the engine and machine sheds at the Bullard brick yard, at Miles City, Mont. The fire is believed to have been started by tramps, but was put under control before great damage was done.

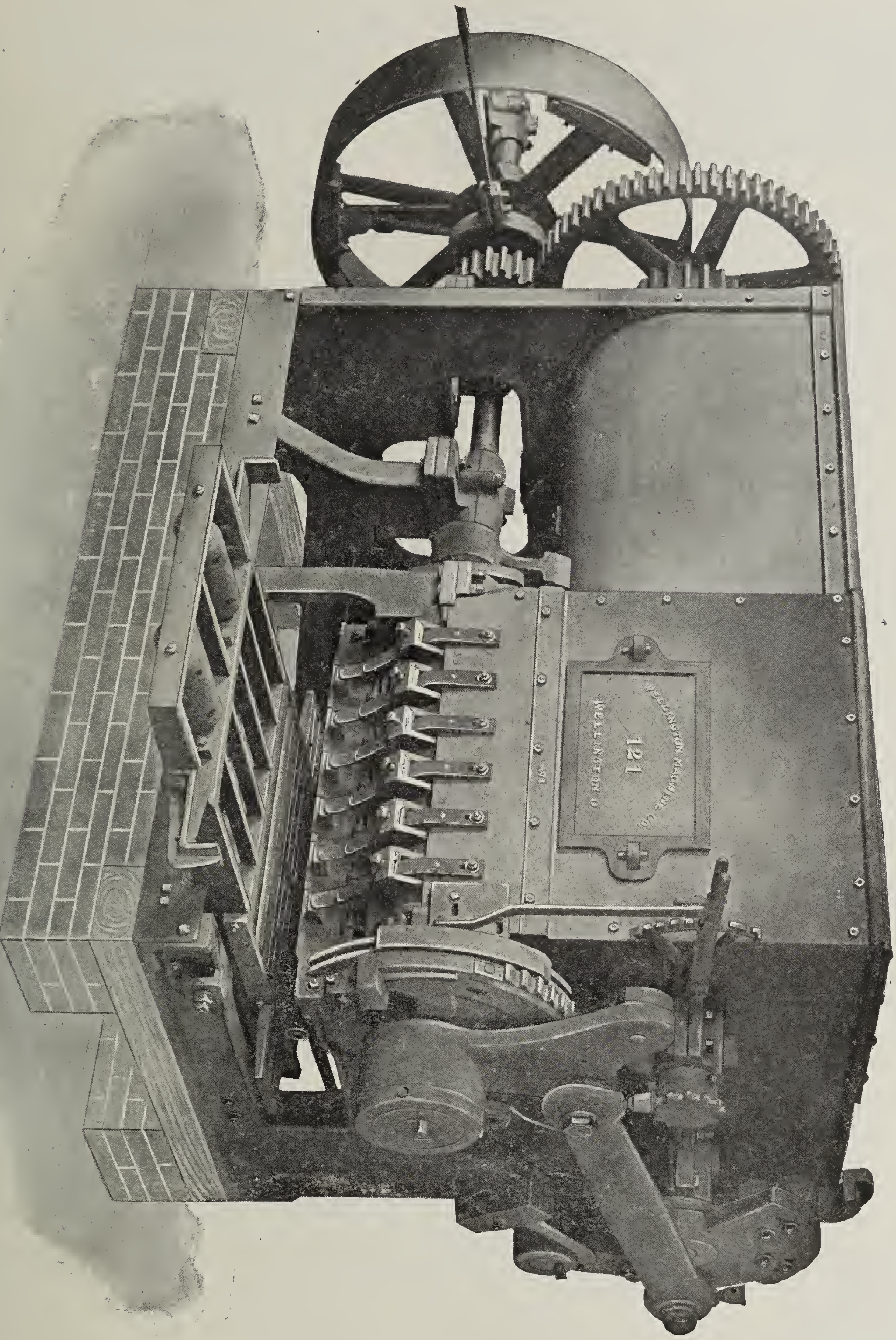
SUNSET.

San Francisco, Cal., June 4, 1904.

AN IMPEDIMENT IN HIS SPEECH.

—Judge.

The "Big No. 6" "Monarch" Brick Machine.



**OVER
175
"Monarch"
Brick
Machines
in use.**

**OVER
500
"Quaker"
Machines
in use.**

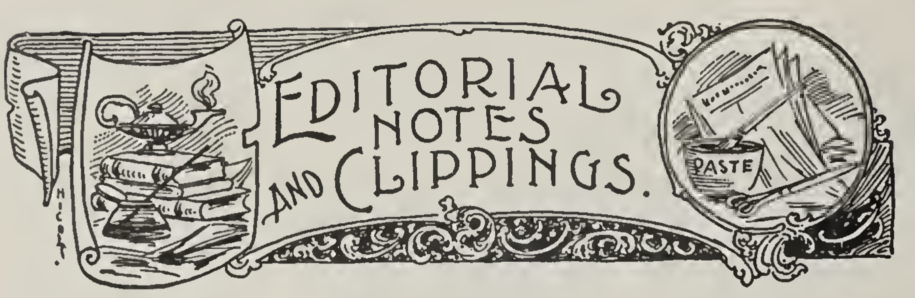
WRITE
to us
regarding
Disintegrators,
Pug Mills,
Mould Sanders,
Sand Dryers,
Smooth-roll Crushers,
Moulds,
Barrows,
Trucks,
Winding Drums,
Dump Carts,
Elevators,
Dump Tables
and all
kinds of
Kiln
Castings.

REMEMBER:
You are losing money wheeling brick unless you have our
ROLLER-BEARING BARROWS.

The Wellington Machine Co.,

WELLINGTON,
OHIO.

Send for Catalogue.



AMBITION'S SONG.

Labor is worship, toil is devotion,
Order is Heaven's perpetual law,
Work is our lot on land or on ocean,
Man's independence the world never saw.
Such is the genius of social relation;
Sloth is rebellion and idleness crime.
God is demanding throughout all creation
Diligence, industry, right use of time.
DUNN.

Dallas Center, Texas, is to have a new brick plant.

J. W. Gray will start a brick plant at Keithsburg, Ill.

Will Glasner is erecting a brick plant at Childersburg, Ala.

The Colonial Pressed Brick Company has been incorporated at Akron, O., with $30,000 capital stock.

W. C. Hawkins and A. J. Pidgeon have started a brick yard at Salem, Iowa.

C. S. Bowser, of New Salem, N. D., will start a brick plant at Richardton, N. D.

The Montello Brick Works suffered a small loss by fire at their plant at Reading, Pa.

A. E. Epley has purchased a tract of land at Oakdale, Neb., on which he has started a small hand brickyard.

W. H. Shancks has opened up a new brick yard at Franklin, N. C. He will manufacture building brick only.

The Avoca (Iowa) Pressed Brick Company will add a number of improvements at their plant, including drying sheds.

The brick plant of J. L. Maxwell at Spartensburg, S. C., was totally destroyed by fire May 13. The plant will be rebuilt.

Jackson & Phelean have installed an Andrus press at their plant at Augusta, Ga., and are now turning out a fine grade of dry press brick.

The Acme Brick Company has been incorporated to manufacture brick and tile at Cayuga, Ind. M., W. T., C. P. and L. T. Boyd are interested.

John L. Knight & Sons, Crown Point, Ind., advise us that they would like to receive prices on sidewalk brick, drain tile and sewer pipe of large dimensions.

The New Brick Company is the name of a new concern at Delaware, Ind., that will manufacture sand-lime brick. H. C. Schlegel is president of the company.

The Hyde Park Brick Company has been incorporated by Herman, Elizabeth, John H., John B. and George H. Suer, at Cincinnati, with $10,000 capital stock.

John Whitehead, South River, N. J., has sold his brick works to Cropsey, Mitchell & Daly for $40,000. They will make a number of improvements in the plant.

Malvern, O., has a new concern known as the Big Four Clay Company. W. A. White, C. O. French, J. O. Anderson, M. L. Santon and H. Powell are the promoters.

M. Hartman and Henry Strunk have organized the Mifflingburg (Pa.) Brick Company. They have purchased a tract of clay land and will push their plant to completion as rapidly as possible.

The Latrobe (Pa.) Brick Company is making additions and extensions to their plant and will manufacture hollow block and tile in addition to brick. They expect to turn out 5,000 blocks and 40,000 brick daily.

The C. W. Raymond Commpany of Dayton, O., with their usual enterprise have issued a large folding map of the World's Fair grounds, which will be sent free to brick manufacturers on application or can be had at their office in St. Louis, 315 Frisco building. This map is artistically engraved and printed in various colors, and the location of any desired point can be easily traced. Full information of all important exhibits is printed on the back. Much time can be saved by the stranger at the Fair by having this map in his pocket for reference.

The Askew Brick Company has been incorporated at Askew, Ala., by Homer Hetrick and M. E. Ames. They have $10,000 capital stock.

Hamburg, Iowa, is to have a new brickyard which will turn out both paving and building brick. H. Lloyd and G. Brown are at the head of the enterprise.

The Reddick Brick and Tile Company, Reddick, Ill., has been incorporated by A. S. Currie, T. J. Buckley and O. J. Patchett. Capital stock, $8,000.

The Lager Brick Company's plant at Aberdeen, S. D., has been completed and is now ready for operation. They expect to turn out two million brick this season.

The Hillenbrand Brick Manufacturing Company has been incorporated at Louisville, Ky., by Andrew, A. P., Oscar and Charles Hillenbrand. The capital stock is $30,000.

August Witka, an employe of the Langenberg Brick Company, Stevens Point, Wis., was quite seriously injured recently by the caving in of the clay bank where he was at work.

The Standard Brick Company has been granted a charter to manufacture brick and other clay products at Macon, Ga. The incorporators are J. H. Alexander, I. L. Dunwoody and O. H. Cabaniss.

Homewood & Bryant have their brick plant at Burlington, N. C., ready for operation. They have a fine deposit of clay and will turn out 20,000 brick at first and will probably increase the output later on.

J. J. Spencer and Capt. James W. Smith have purchased the brick plant of Kleffner & Revare at Portsmouth, O. The new owners will make a number of improvements in the plant and begin operations at once.

The Holton Brick Company, Muskegon, Mich., reports a busy season. Henry Connell has recently acquired an interest in the business. He is an engineer of ability and will have charge of the mechanical end of the business.

The barn of the Knoxville (Tenn.) Brick Company, at Powell's Station, was destroyed by fire recently, with a loss of $500. All of the grain and corn was destroyed, and one mule was burned to death. No insurance was carried on the property.

T. J. Andrews writes that he will build a small drain tile factory at Heber, Ark., and will be pleased to receive catalogues and price list of tile machinery and supplies. He would also like to correspond with a man competent to take charge of a small tile plant.

Brick manufacturers visiting the World's Fair can see Raymond brick machinery in operation on several plants at or near St. Louis. Call at their St. Louis office, where their representative will be glad to welcome you and to pilot you to any desired location. Office 315 Frisco building.

The Davenport (Iowa) Paving Brick and Tile Company was sold at sheriff's sale recently and brought $20,000. The plant was bought by a new corporation which will be known as the Davenport Brick Company, among the owners of which are August E. Steffen, Mrs. R. Lange, Mr. Roddewig and others.

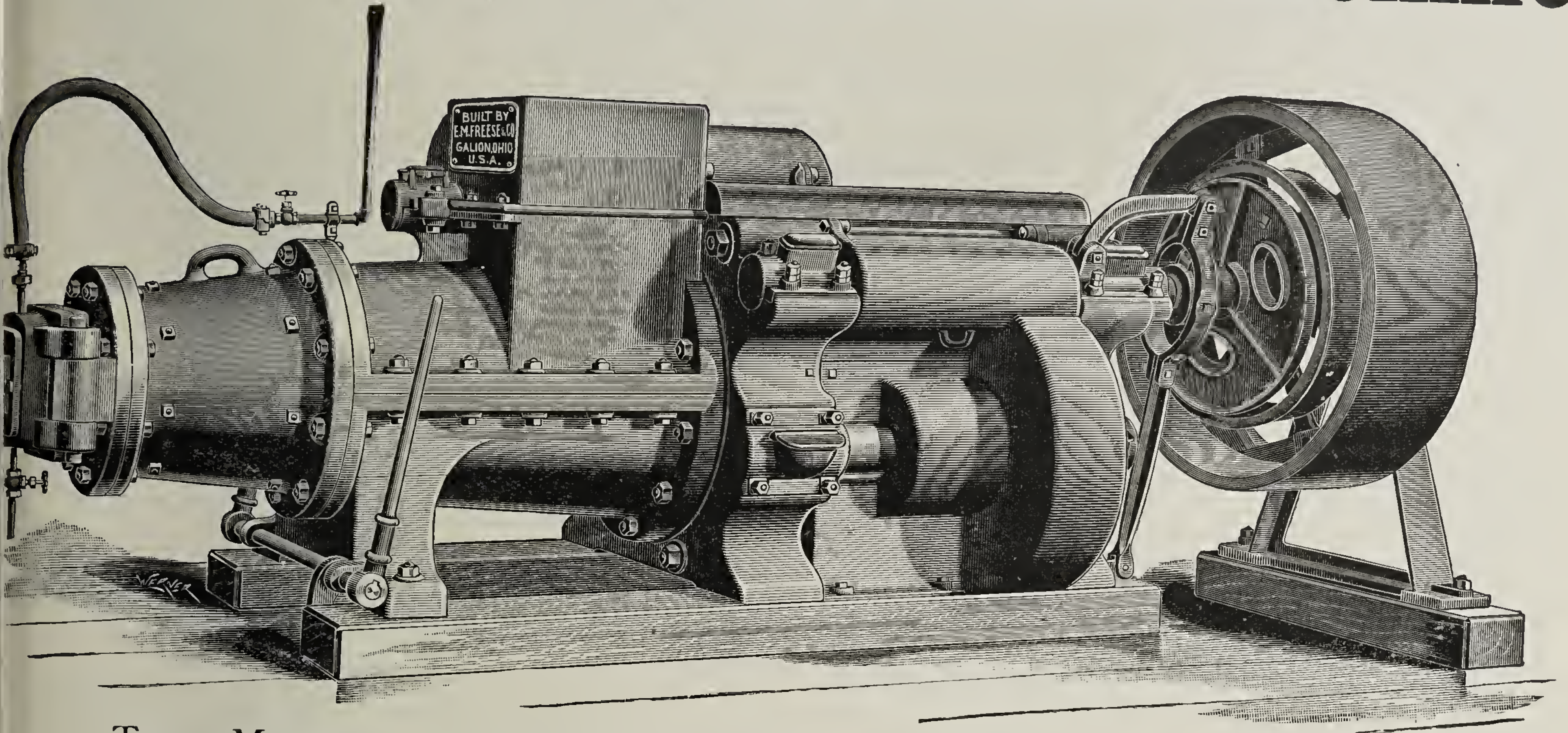
C. C. and Brad. Jones write that they are putting in a stiff mud equipment at their plant at Alberquerque, N. M., and will soon be turning out paving brick as well as red and buff builders. They say they have the best clay deposit in their county and that it includes a deposit of genuine ochre and a red mineral paint bank.

Arthur W. Perkins and Clarence B. Flint have been appointed temporary receivers of the Newton Fire Brick Company of Albany, N. Y., and granted permission to borrow $5,000 with which to continue business. The company is about to make a voluntary dissolution. Liabilities are $21,234. There is a mortgage for $42,125 against the property of the company. The company owns clay valued at $9,000, and there are outstanding claims of $5,000.

The Banner Clay Works, a new industry instituted at Edwardsville, Ill., by St. Louis parties, is about completed and the manufacture of building and paving brick has been commenced. The plant was erected at a cost of $115,000, and is located over a bed of shale 70 feet thick. There are eight downdraft kilns, which required 2,400,000 brick in the making. Dr. Jules Baron is president; Frank Frohmeyer, vice-president; William Loeffler, secretary and treasurer, and William C. Mitchell is general manager. Mr. Mitchell has had a wide experience

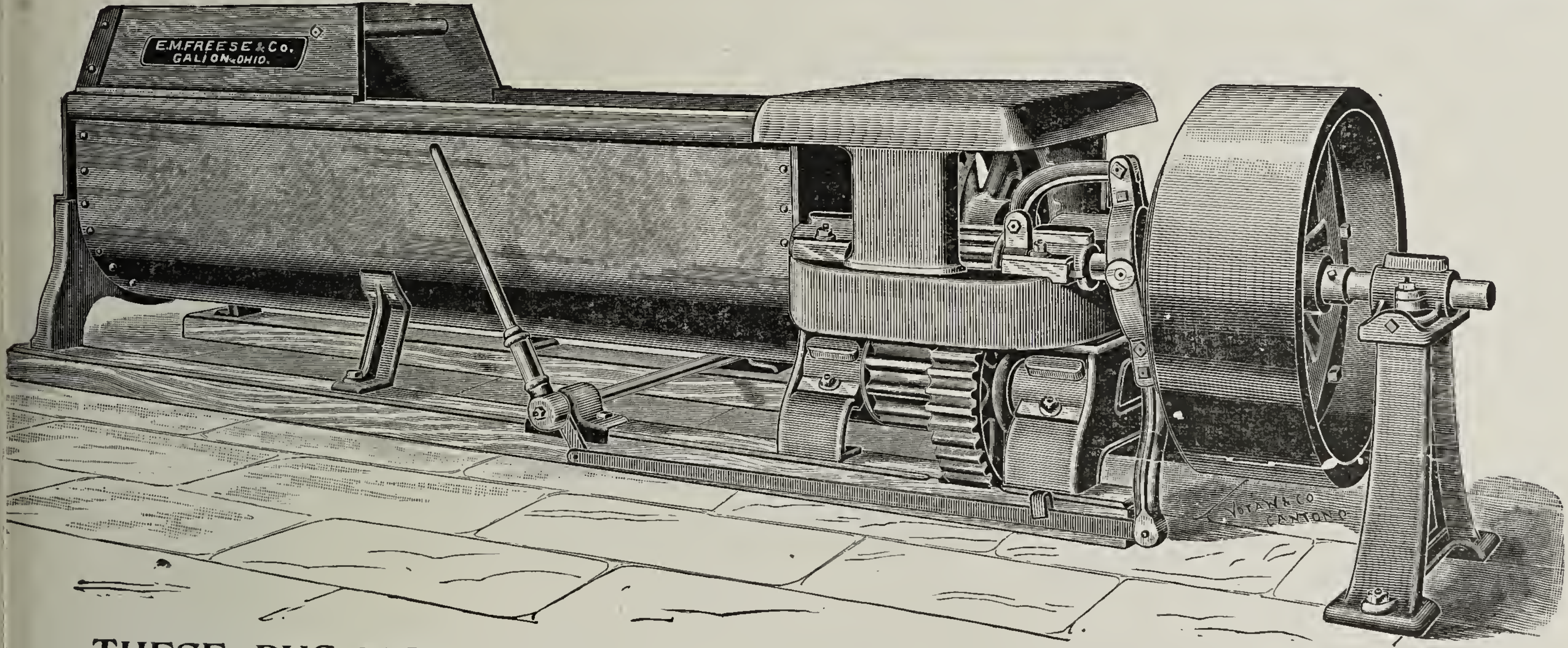
[CONTINUED ON PAGE 750.]

Our Mammoth Brick Machine



THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

Our Pug-Mills Have Features of Great Merit.


E.M.FREESE & Co.
GALION, OHIO.

THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 790 and 791.

EDITORIAL NOTES AND CLIPPINGS—Continued.

in the manufacture of clayware and is quite proud of his work on this new plant, which will have a capacity of 50,000 brick a day.

The Independence Shale Brick Company has been reorganized at Independence, Kas., with K. B. Trowbridge as president and treasurer.

Geo. R. Roller, Canton, Ill., writes that his business this year is all that could be desired, unless it is more capacity, for he is not able to fill his orders.

A charter has been granted the Rowan Brick Company of Salisburg, Va. T. C. Coneley and others are interested. They will manufacture drain pipe and tiling as well.

The Peerless Brick Company has been chartered at Lebanon, Pa. The capital stock is $25,000, held by Dr. J. R. Beckley, Jacob E. Reinoehl, M. Schwegler and H. P. Mover.

The College Springs Brick Company is a new company organized at College Springs, Iowa, by M. L. Whittaker, W. S. Farguhar, E. L. Dryden, W. O. Grove, J. C. Dow and J. Dee.

The Newburg Brick and Clay Company has been organized at Cleveland, O., with $50,000 capital stock. Frederick W. Green, H. Schmitt, Walter A. Burnett, E. W. Coit and Jr. Zmunt are interested.

The Whitewater Tile and Pressed Brick Manufacturing Company has been organized at Whitewater, Wis., with $30,000 capital stock. C. W. Bertram is president and F. A. Morse secretary of the company.

The Saginaw (Mich.) Clay Manufacturing Company's plant is running full handed and they have difficulty to meet the demand for their pavers, which are selling at $15.50 per thousand. Their pavers are also used to some extent in construction of houses.

Of course you will "go down the pike" at the World's Fair when in St. Louis. Full information of the various "summer resorts" located on the pike can be had from the World's Fair Map, issued by the C. W. Raymond Company of Dayton, O. They're free.

The plant of the Shissler Brick Works at Clifton, Pa., has been leased by the Aldan Brick Company. The plant has been idle for some time and was in a bad state of repair, so it will be almost wholly rebuilt, and when finished will have a daily capacity of 50,000 brick. The machinery for the plant will be furnished from the shops of E. M. Freese & Co., Galion, O.

Carl Bechtel, president of the Co-operative Brick Company, died May 24 at a sanitorium in Des Moines, Iowa. He had only been ill about two weeks with a complication of diseases of the stomach. Mr. Bechtel was but 38 years old and had a life of promise before him. His untimely demise is deeply deplored by all his many friends and associates. He leaves a wife and one child.

The Adrian (Mich) Manufacturing Company, capitalized at $100,000, was organized last Saturday, the 7th. The officers of the company are composed of the following gentlemen: President, Alex Zagelmyere, of Bay City; vice-president, F. E. Schoonmaker, of Adrian; secretary and treasurer, J. Fennimore Cooper, of Bay City, Mich. The Oviat Wagon Works will be moved to Adrian, which is taken in with the new company. The company will continue the manufacture of brick and tile machines, but the wagon business will eventually take the lead. The new company has purchased the brick and tile works for a plant.

The A. W. Miles Company's brick plant at Livingston, Mont., was destroyed by fire recently, causing a loss of $10,000. They will rebuild at once.

The brick and tile factory of F. E. Swift & Son at Washington has been sold to W. A. Flint and L. T. Mostoller of Hoopeston, Ill. Both gentlemen have had considerable experience in the business.

The C. M. Miller Manufacturing Commpany has started up the new plant at West Terre Haute, Ind. The plant is equipped with machinery from the shops of the Wallace Manufacturing Company, Frankfort, Ind.

Orrin Wetherby has discovered a large deposit of clay on his farm near Bolivar, N. Y., which has been tested and found suitable for red brick and tile. A company will probably be organized to develop the clay.

The tile plant of William Cast at Scircleville, Ind., was almost completely destroyed by fire May 18. The loss is estimated at $8,000, on which there was no insurance. Mr. Cast is uncertain as to whether he will rebuild.

The Middlesboro (Ky.) Pressed Brick Company has been incorporated with $20,000 capital stock. The incorporators are J. F. Harkness, of Middlesboro; W. S. Harkness, of Jellico, Tenn., and A. M. Harkness, of Santa Fe, N. M.

J. B. Armstrong & Sons are making preparations to manufacture brick at Shenandoah, Iowa. They will make by hand at first, but later on expect to put in all necessary machinery and appliances for a first-class machine plant. The clay has been tested with very satisfactory results.

The Miller-Burns Fire Brick Company, located at Mission Ridge, Ga., has changed its name to the Willard Brick Company and increased its capital stock from $20,000 to $50,000. Extensive improvements will be made on the plant, and the business of the concern will be increased in every possible manner. The concern employs more than fifty men and manufactures fire and common brick for buildings and grading purposes. G. H. Miller is president, F. L. Miller, vice-president, and John H. Cantrell is secretary of the concern.

A new enterprise at Rockwood, Tenn., is the Rockwood Brick and Tile Company. The plant is located near the Tennessee Central Railroad, a siding having been built by that company to accommodate them. The new company has everything in its favor and ought to make a great success. Inexhaustible quantities of coal is found but a few feet away, giving them cheap fuel. Operations at the plant were commenced the week of April 24. The present capacity of the plant is about 30,000 brick per day, but it is expected to add considerably to that as trade conditions warrant.

SAWS

ODD LENGTHS OF RUBBER,
AND GIANT RED STITCHED.

from 2 ft. to 80 ft long, and from 1 in. to 16 in wide; 3, 4, 5, 6 and 8 ply FIRST-CLASS BELTING less than mfrs. cost prices. GET OUR PRICES on Rawhide, Paulins, Tank Pumps, Hose, Injectors. Steam Gauges, Brass Fittings, Lard Oil, Cylinder Oil, Machine Oil, Emery Wheels, Files, Iron and Wood Split Pulleys, Mill Dogs, Weller Jacks, Circular Saws, Sawing Machines, One-Man Log Saws Asphalt Felt Roofing, Endless Thresher Belts. One Trial will make you a regular customer of the

MILLER OIL & SUPPLY CO Indianapolis.

Send for Catalogue.

ALPHA CANVAS BELTING.

has proven very satisfactory in its several years' use on all of our machinery, and has given us no trouble whatever. We cheerfully recommend it to Clay Product Manufacturers. THE MALVERN CLAY CO. (Malvern, Ohio.)

THE AMERICAN BELTING CO., YOUNGSTOWN, OHIO.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XLII. INDIANAPOLIS, IND., JULY, 1904. No. 1.

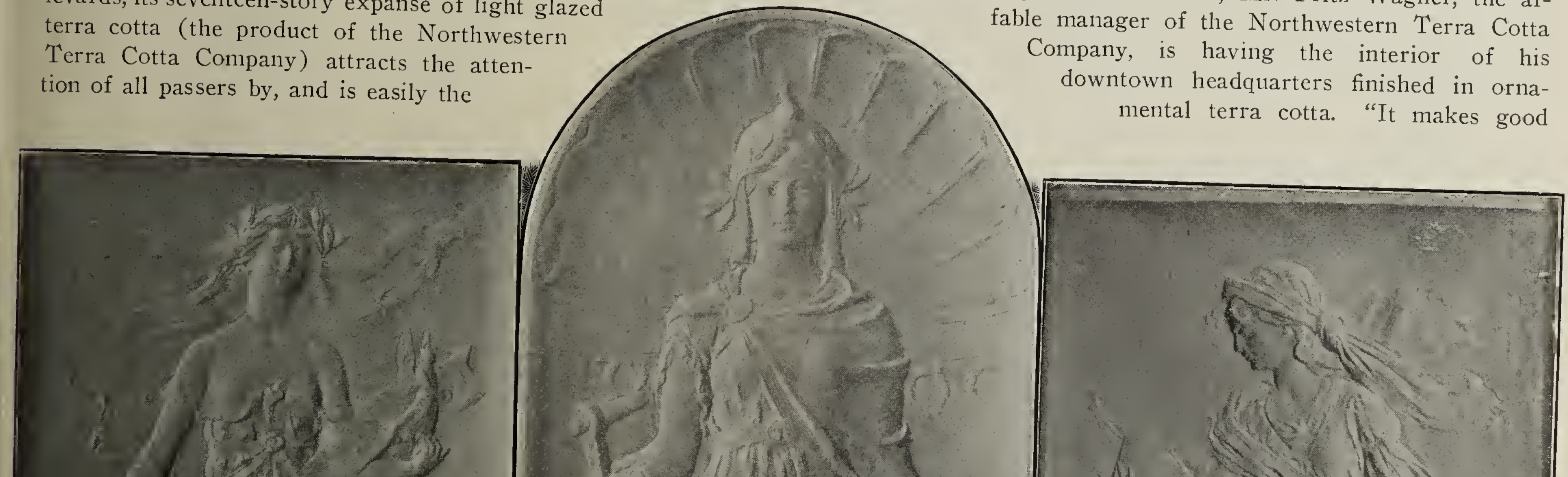
Written for THE CLAY-WORKER.

THE RAILWAY EXCHANGE BUILDING.

Chicago's Latest Example of Modern Skyscraper, Faced Inside and Out with Glazed Terra Cotta and Brick.

ONE OF THE MOST strikingly handsome mercantile structures in downtown Chicago is the new Railway Exchange building, which is now practically completed and has been receiving tenants for upwards of a month. Standing at the corner of Jackson and Michigan avenue boulevards, its seventeen-story expanse of light glazed terra cotta (the product of the Northwestern Terra Cotta Company) attracts the attention of all passers by, and is easily the most pleasing structure of its kind on either boulevard.

As is implied in the name, the Railway Exchange building is the home of offices for a majority of the railroads centering in Chicago, and also affords accommodation for many railway supply and construction companies. In addition, however, it is the terra cotta home of the Northwestern Terra Cotta Company, which furnished the material both for exterior and interior finish. On the fourteenth floor they have a pleasant suite of rooms overlooking the Lake Front Park, the inner harbor and the lake beyond. Not content to have his rooms in the "terra cotta palace" exactly like the others, Mr. Fritz Wagner, the affable manager of the Northwestern Terra Cotta Company, is having the interior of his downtown headquarters finished in ornamental terra cotta. "It makes good



Decorative Features of the Railway Exchange Building, Executed in Terra Cotta by the Northwestern Terra Cotta Co., Chicago.

looking wall paper," he says, "and doesn't have to be renewed every year."

The building, which is probably the most up-to-date in the city, was designed by D. H. Burnham & Co., architects, who have the largest suite of rooms on the fourteenth floor for their offices. The total cost of the building is estimated at about $2,000,000. The terra cotta job alone, was one of the biggest contracts of the kind taken in the city, about 150,000 superficial feet of the material having been used on the exterior work alone. The terra cotta in the structure is of a light cream color, so highly glazed that soot and dirt cannot be grimed in, and all that is necessary to restore the outside of the building to its pristine luster is the application of a wet sponge. On the main floor offices and stores are ranged around a spacious rotunda, white in finish and coolly attractive. The floor and wide staircase is of marble, but the frescoed walls and ornamental balustrades are of terra cotta. Rising above this the walls of the court are constructed of highly glazed Tiffany enamel brick, making the interior offices light and cheerful.

The Railway Exchange Building, Chicago.

The exterior finish of this building marks another step in the process of transforming smoky Chicago into a white city. The same transformation, it is predicted, will be worked in all large cities where smoke and dirt predominate in the atmosphere as they do in Chicago. The Schlesinger & Meyer building, now occupied by the new drygoods house of H. G. Selfridge Company, is another building of comparatively recent construction, finished with the same idea, namely, with material that can be kept clean. A light, attractive material was preferable to the dark stone, brick and granite used in the buildings of former years. In time it is thought all the buildings along Michigan avenue in the business district will be of this light finish, and this style will spread, it is hoped, through the remainder of the business section.

Members of the British Institution of Mechanical Engineers, which recently held a joint meeting in Chicago with the American Society of Mechanical Engineers, expressed great admiration for this and other buildings of this type, and said they would favor trying the experiment in their own smoky cities on the little island in the sea.

The erection of this building is responsible for an amusing incident, which is in reality a bit of warfare among the railroads. Hardly had the railroad companies—and the other tenants—moved into the Railway Exchange building when the heads of the great smoke-producing industries of transportation began to notice that the glory of their immaculate offices were shortly to be marred by the clouds of smoke which drifted over from the suburban tracks of the Illinois Central railroad with the passing of the trains every few minutes. To the railway officials ensconsed within snowy walls such a state of affairs seemed sacreligious. The Illinois Central people, not being tenants of the building, are scarcely considered as having standing by the railroad companies who complain of the smoke nuisance, and it is predicted that the offending road will shortly be compelled to use electro-motors in moving its suburban trains.

Written for The Clay-Worker.

CLAY DUST—NO. 13.

Standard Specifications for Building Brick.

By A. Lumina.

ON THE PROGRAM of the Cincinnati Convention were two questions that were not discussed, but which, it seems to me, ought to receive the attention of all brickmakers, and which, I believe will, in the near future, require deliberate action by our association. These questions were No. 7, "Is it practical to establish standard tests for building brick? If so, what action should be taken by our Association in the matter?" and No. 9 "What tests should be made to determine the fitness of sand-lime brick for building purposes?"

The most valuable piece of work done by the National Brickmakers' Association was the establishing of a standard test for paving bricks. Now all municipal engineers make this test and fix the requirement in their specifications. Later the Association prepared standard specifications for the construction of brick pavements. This work has been of incalculable value to the manufacturers of paving brick. By establishing a higher standard of brick, which all manufacturers must reach, and a proper method of constructing brick streets, it has placed brick pavements on a higher plane of excellence and increased the demand for them.

Now, what about building brick? Can nothing be done to prevent the manufacture and use of poor brick, brick that soon disintegrate and weaken the structure, common brick that are not durable, and face brick that are unsightly, that absorb water and soot and that exude the white or yellow and green salts that are so objectionable? Does not every one know that poor brick are the greatest enemy of the brickmaker, whether he makes them himself or whether they are made by his competitors? Every poor job of brickwork in a community tends to prevent the use of brick in other structures. The difficulty of securing good brick with no definite specifications and no reliable tests, causes the architect or engineer to use other materials instead.

There are standard specifications for wood, iron and cement, but for brick only general terms that are incapable of definite interpretation. Hence brick manufacturers are careless and cling to old haphazard methods. Even those who build new plants for making brick are content to do as others are doing, and instead of equipping themselves to produce a better brick look only to make them cheaply and with as little investment as possible. It is evident to anyone familiar with the subject that the standard of qaulity of building brick is not being raised to any appreciable extent. On the contrary, the formation of combinations in our large cities, with the brick all sold through a single office, has in many cases had the effect of lowering the quality. Some manufacturers have become less careful of sending out none but good brick, and architects and contractors less particular in their inspection, knowing that if they reject the brick delivered to them they will not be able to get others promptly.

All of this works against the use of brick and favors other material. What can be done to prevent this? How can a higher standard of excellence in brickwork be secured? I know of but one way, and that is the way adopted by the manufacturers of paving brick. The poor brick and improper laying of many brick streets retarded considerably for a time the use of this material for paving. Standard tests and standard specifications have done much to bring brick pavements into favor. Manufacturers of building brick can accomplish as much by similar action.

We are accustomed to say that the use of brick for building purposes must increase, since the supply of lumber is limited and constantly decreasing, while the supply of clay is inexhaustible. We overlook the fact that other materials are coming into use to take the place of clay. If clay is to maintain its supremacy as a structural material, brick manufacturers must be aroused to the importance of making better brick. The statistics of the United States Census Bureau show that from 1880 to 1890 the use of brick increased in a much greater ratio than the population and wealth of the country, but that from 1890 to 1900 the use of brick did not keep pace with the increase of population and wealth. What the next decade will show, depends much upon what extent other materials are substituted for brick, and this in turn depends much upon the quality of brick that are produced. An uncertain element in this calculation is the

SAND-LIME BRICK.

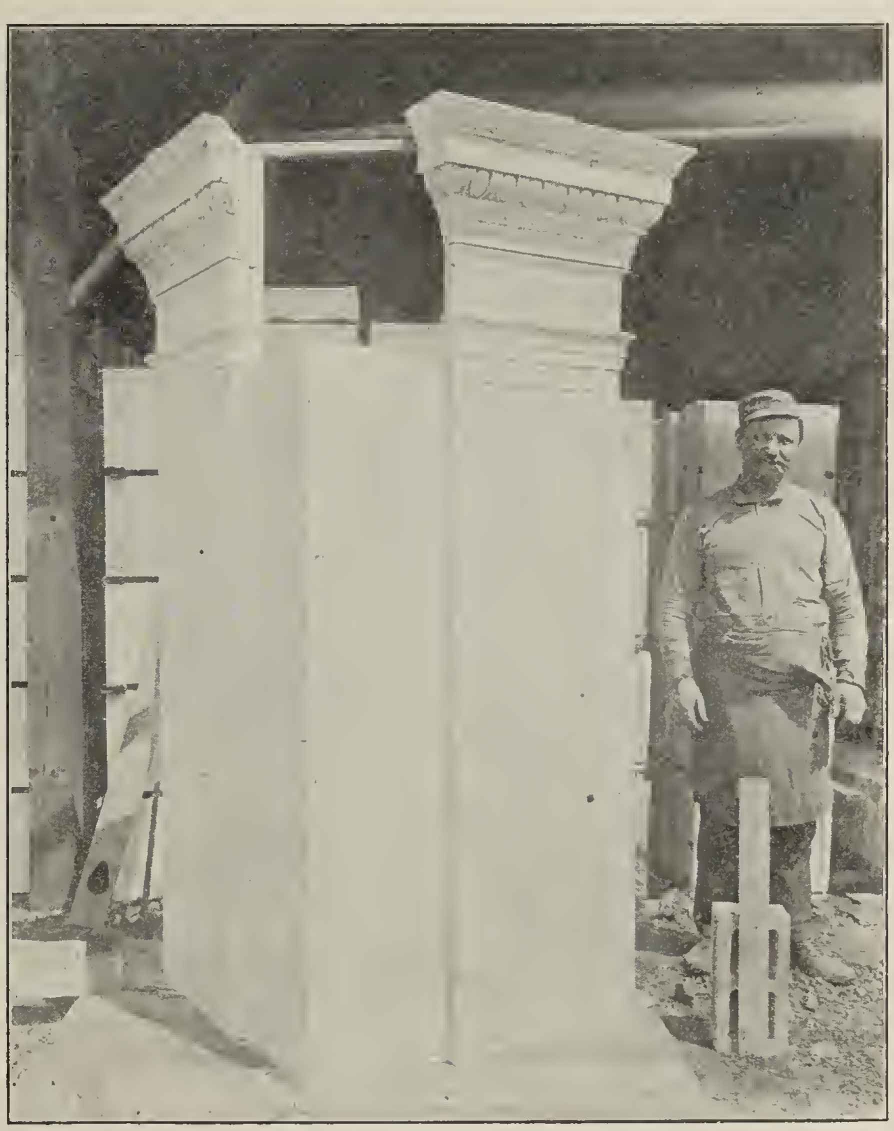
The rapid development of the sand-lime brick industry in America means either one of two things—that sand and lime are going to take the place of clay to a considerable extent, or that there is going to be a lot of money sunk in this business. I think it is quite probable that both results will follow. This process has recently been imported from Germany, but the investors in this business are probably not familiar with the history of the development of the "kalksandstein" industry over there. And here let me say that I am always calling this brick the lime-sand brick, as the Germans do, instead of the sand-lime brick. I think it was a mistake for us to adopt the latter, and I don't know who is responsible for it. There are two kinds of sandstone brick made, but the method that has been most successful is that of limeing the sand rather than by cementing it. I look upon the word lime in the name of this brick as having the force of an adjective, as evidently do the Germans, and hence that its proper position is before the noun sand. Moreover, I go further with such hyphenated compounds and prefer to write them as one words in the English language, but I think that we are too slow in arriving at the point of dropping the hyphen. We are now quite accustomed to write firebrick and fireclay as one word and there is a tendency to write terracotta as one word, as it should be. Why not then designate this sandstone brick as *limesand* brick?

Now as to the experience of our German brethren in the limesand brick business, it is only relevant to the purpose of this article to mention their efforts to improve the quality of the limesand brick and increase its use by creating confidence in its durability. An association was formed of those engaged in the manufacture of these brick. The object of this organization was not only to consult with each other in regard to the misrepresentations of the promoters of this business as to the cost of production, but also to establish standard tests and specifications for limesand brick. In this they had the co-operation of the government, since in Germany a man is not allowed to use any material he may choose in the erection of his buildings, as is the case in this country outside of our large cities. His material and methods of construction are subject to rigid inspection. Hence the limesand brick can be used more safely there than here, and people use them with more confidence. Leaving out of consideration the cost of production of the limesand brick in this country, it seems to me that at the present rate the supply is going to be in excess of the demand for such a new and untried product.

It is more important for the makers of limesand brick to secure the establishment of standard tests and specifications than it is for the makers of clay brick, but it was rather the purpose of this article to show that some action should be taken by our National Association of Brick Manufacturers to establish standard specifications for clay building brick of all kinds.

AMERICAN SOCIETY FOR TESTING MATERIALS.

This matter has recently been taken up by the American Society for Testing Materials. This society is affiliated with the International Society for Testing Materials, and has done excellent work in establishing standard specifications for iron, steel, cement, bitumen, steel-concrete, road materials, etc. This society has a membership of nearly 500. The president is Charles B. Dudley, chemist of the Pennsylvania railroad, Altoona, Pa., and the secretary-treasurer is Edgar Marburg, professor of civil engineering, University of Pennsylvania.



Fitting the Sections and Capitals of a Terra Cotta Column at the Factory.

At a meeting of the society held at Atlantic City, June, 1902, the following resolution, introduced by Prof. William K. Hatt, was approved: "That the executive committee be requested to consider the advisability of appointing a committee to report on specification for paving brick and building brick." Later, the following members were appointed on this committee: Edward Orton, Jr., Ira O. Baker, W. K. Hatt, Edgar Marburg, L. W. Page, W. D. Richardson and Arthur N. Talbot.

It is hardly probable that this committee will do much more on paving brick than to accept the work done by the National Brick Manufacturers' Association and adopt our standard tests and specifications, but on building brick they have a clear field and we will watch their investigations with much interest.

So, without any effort of the brick manufacturers, there will doubtless be prepared in due time standard specifications for building brick. The report upon these specifications, promulgated by a society of such world-wide reputation, will secure their adoption by architects and engineers everywhere. No doubt this society will have the assistance of some prominent brick manufacturers in their investigations. On this committee are two old members of the National Brick Manufacturers' Association, who will doubtless look after the interests of the brick manufacturers and secure their co-operation. But our association should not delay longer in making a declaration of the desirability of such standard tests and specifications and in offering its encouragement and support in this matter to the American Society for Testing Materials.

Written for THE CLAY-WORKER.

THEORY OF DRAFT AND CHIMNEYS—No. 4.

By THEO. RIZER.

CHIMNEY FOUNDATIONS.

LOGICALLY AND FROM an engineering standpoint the first detail of chimney construction to demand our attention is the location and design of the foundation. The location is naturally subordinate to the arrangement of the boilerhouse or kilns, but there are other factors that may not be ignored in dealing with this phase of chimney construction. Owing to its preponderant weight, the chimney should be isolated from any buildings or other walls; that is, the stack and the walls of any building should not join, nor should the foundation footings be in conjunction unless the soil is unyielding and settlement unlikely. If absolutely necessary to build the chimney adjoining other important walls in order to run the flue to the best advantage, good judgment would require that a straight joint be provided between the chimney and wall so that any unequal settlement between the two would not crack and injure the brick work.

The character of the soil on which the chimney is to be built should be carefully inspected and the area of the foundation designed of sufficient extent to support the combined weight of the chimnev and the foundation without exceeding the safe bearing strength of the soil. The safe values usually assigned various soils by good engineering practice are given in Table VI.

TABLE VI.

Character of Soil.	Safe Bearing Values in Tons Per Square Foot.
Solid bed rock	200
Well compacted broken rock.	5 to 25
Soft, friable rock	5 to 10
Clay in beds 15 feet thick, or more—	
Absolutely dry	4
Moderately dry	2
Soft, wet clay	1
Dry gravel, well packed and confined. . .	6 to 8
Pure dry sand, well packed and confined .	4
Pure dry sand in natural bed.	2
Quick sands and marshy beds	½
Good, solid, dry natural earth	3 to 4

Where there is a liability of the foundation soil becoming loosened by water or by adjacent building operations, proper measures should be taken to prevent any damage to the stability of the foundation which might occur from such contingencies. Wherever practicable it is incumbent upon the chimney builder to see that poor soils are improved to better adapt them for supporting the great weight of the superimposed chimney. This will probably require that a system of drainage be installed where the soils are excessively wet; and, in case the soil is loose and yielding, ramming may be resorted to as beneficial; but it is far better in such instances to provide concrete footings, which in extreme cases, may be supported by piles on the grillage system.

The necessity of providing stability against wind pressure requires that the foundations and footing courses of brick chimneys be, in general, made much heavier than for the walls of buildings. Where the underlying soil of a foundation is of clay or other yielding material, it is not unusual for a chimney 200 feet in height and 20 feet across the base to have concrete footings 10 or 12 feet in depth. The inside of such foundation may be filled with brick or concrete to add weight. The batter of the outside of the pier should never exceed one foot to two feet of rise.

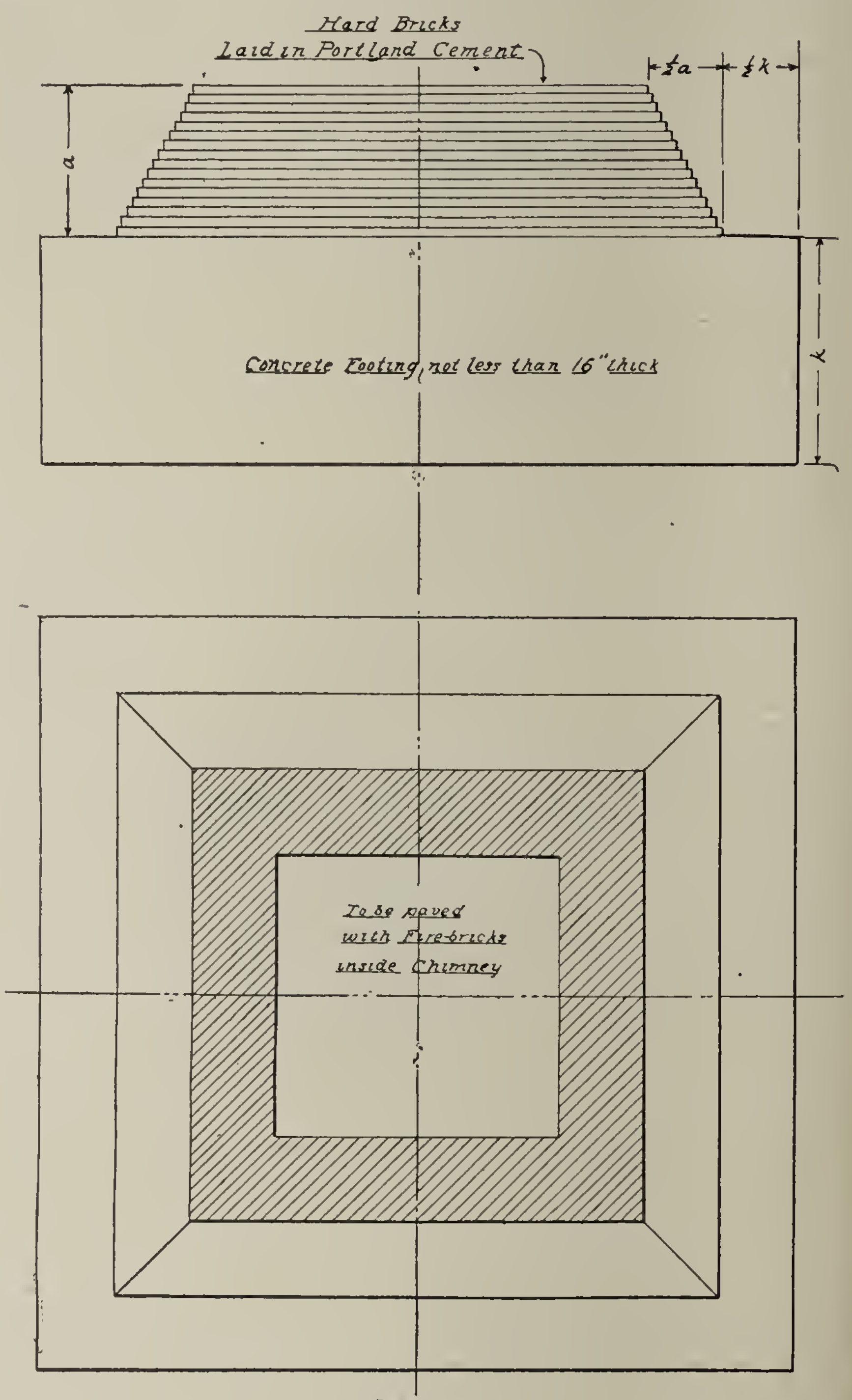

Hard Bricks
Laid in Portland Cement
½a
½k
a
k
Concrete Footing, not less than 16" thick
To be paved with Fire-bricks inside Chimney

Fig 10

In Fig. 10 is shown the design of a foundation for an underlying soil of good, dry natural earth having a bearing value of three to four tons per square foot. The concrete footing is composed of one part cement, two parts sand and five parts broken stone whose dimensions will permit them to pass through a ring not exceeding two inches in diameter. The distance that the concrete bed extends beyond the brick portion of the foundation should not be greater than one-half the depth of the concrete bed, which depth should never be less than 16 inches. The body of the foundation is best composed of good, hard bricks laid in cement mortar and faced with firebrick to form the floor of the stack.

If the soil is of such nature that it does not afford an unyielding support for the foundtion, recourse is frequently had to timber piles, which, if properly driven, is considered a satisfactory and permanent foundation. These piles may be made of elm, larch, fir, pitch, pine, beech, white oak, cypress, chestnut, cedar, Norway or Oregon pine. The straightest grained timber should be selected, the bark removed, and any rough projections trimmed off. All large knots should be avoided, diagonal knots especially being a source of danger as the pile is very likely to be broken off at the point where they occur. It is best to select whole timbers for piling, and have the heads bound round with wrought iron rings to prevent splitting in driving.

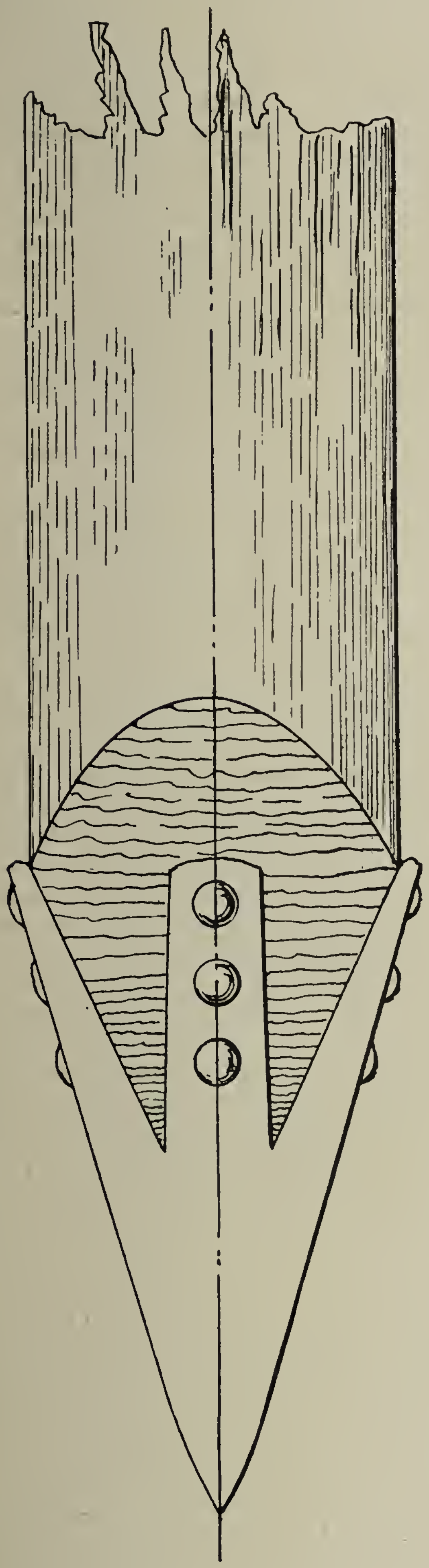


Fig. 11

The lower ends of the piles must be sharpened to a point; and if hard ground is likely to be encountered in driving, it is necessary that the points should be shod with iron, as shown in Fig. 11.

As these piles are driven into the soil to compress and consolidate it, they are driven as close together as is possible without the driving of one pile causing the others to rise. To prevent this with piles having an average diameter of six inches, practical trials have shown that it is necessary to place them at intervals of about two feet six inches from center to center.

After the piles are driven and the heads sawn off level, a timber platform is generally laid upon them. This consists of heavy square balks or string pieces and cross pieces notched into one another and forming a grating or grillage. The string pieces are notched over the heads of the piles and secured by trenails. The piles are driven from six to twelve feet into the ground, and the earth removed from between them for a depth of three or four feet. This space is then filled with concrete made as previously stated. The intervals between the cross timbers of the platform are sometimes similarly filled in; and, in some cases, a bed of concrete is substituted for the platform altogether. Where there is a really good, strong bed of concrete, the string pieces and cross pieces may with advantage be omitted; since a disadvantage connected with their use is the fact that the heads of the piles are apt to bend and crush into the longitudinal fibers, indenting the timber and causing the frame work to sink down upon the pile heads, thus, in all probability, tilting the stack out of plumb.

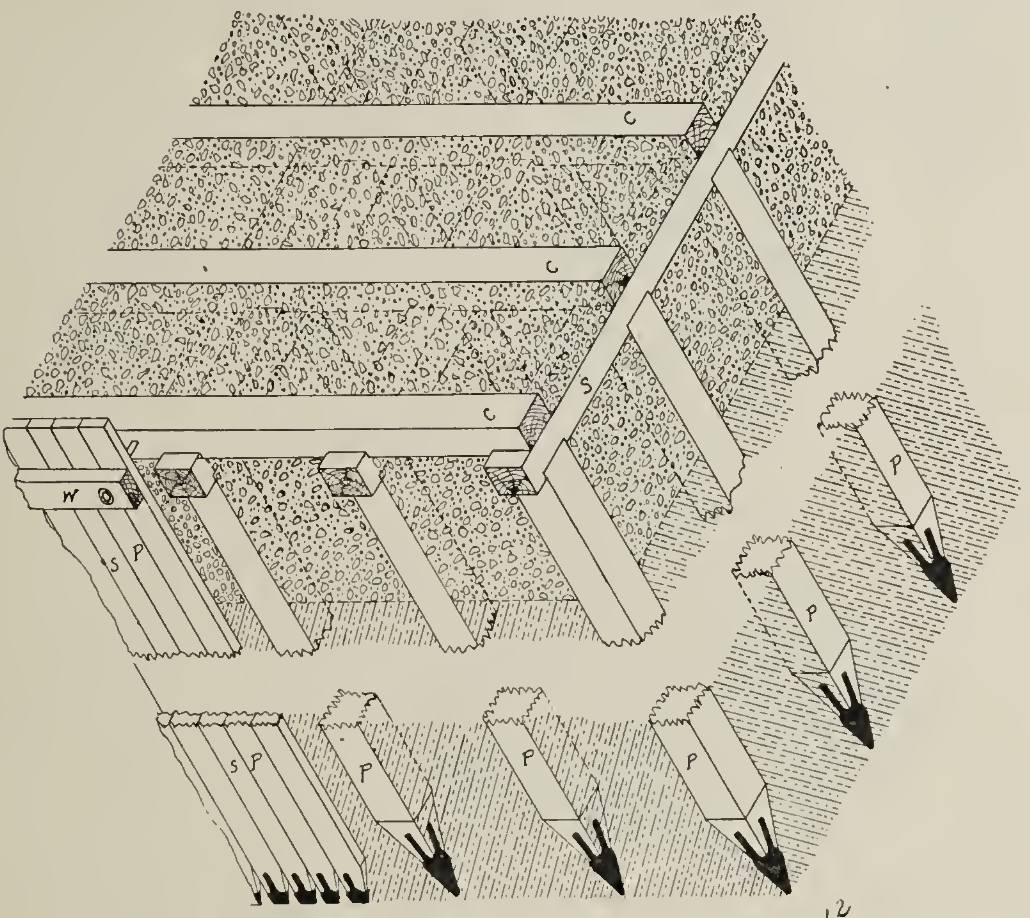


Fig 12

There are various causes that lead to the failure of pile foundations. These causes are due to the conditions to which the foundations are exposed in different situations, the principal one with which we have to deal in chimney design being the liability of failure from the softness of the surrounding ground, which may not offer sufficient resistance to a lateral movement. In consequence of this, the piles lose their upright position, and the chimney is given a tendency to overturn. To guard against such a contingency and also to prevent the spreading of the ground laterally and the harmful action of water, sheeting piles are often used to enclose the sides of the foundation. These sheet piles consist of flat planks, which may vary from three to ten inches in thickness. They are sometimes grooved and tongued down the edges so as to form a tight joint, and sharpened to an edge at the lower end, which must be shod with iron. The method of employing sheet piling for the protection of a foundation is shown in Fig. 12, which illustrates a method of grillage pile foundation. The sheet piling are shown at *s p* driven between the walling (*w*) and the outer crosspiece of the grillage.

In the construction of pile foundations near existing walls, it is necessary to use great care in order to avoid disturbing or shaking the foundations of such walls or buildings. Where the design calls for the driving of piles near foundations already in place; especially if such foundations support heavy walls and the surrounding earth is apt to yield considerably to the compressive action of the piles and weight of the superimposed load, such construction ought to be abandoned, and the proposed foundation newly designed in such a manner as to prevent the danger attending the disturbance of adjacent foundation footings.

Foundations should invariably be carried below the frost line, which, in high latitudes, may necessitate a depth of six feet or more. *(To be Continued.)*

APPRENTICESHIPS.

An Address Delivered by Hon. Anthony Ittner, St. Louis, Before the National Manufacturers' Association.

THE OLD TIME apprenticeship, under which the same shop, at opposite sides of the the master and the apprentice worked in same work-bench or on the same scaffold, has perhaps passed away never to return. The system of apprenticeships which prevailed in America at the middle of the century just closed, and for many years thereafter, has been rendered practically obsolete through the arbitrary and tyrannical methods of organized labor.

The pleasant relations that formerly existed between the master and the apprentice and between the employer and the employee have, since the advent of labor unions, become but a memory. It was by no means an uncommon thing for master and apprentice to live under the same roof, and in fact to be of the same family. I well remember the pleasant relations that existed between my master and myself during the years of my apprnticeship and which continued to exist after I had finished my time and become a journeyman. Equally pleasant relations were kept up with other employers for whom I worked and of whom I had several. The employer and his men always addressed each other in those days by their Christian names, which were generally abbreviated into Jack, Jim, Andy, Tom and the like. I worked as an apprentice and as a journeyman for five different employers, and the recollections of those days are among the happiest of my life.

But since the introduction into this country of that most un-American institution, the Labor Union, things have changed. Apprenticeships in many trades are absolutely barred, and in others they are so restricted that they might as well be abolished for all practical purposes.

The Government Labor Statistics show that in the cities of New York, Chicago and Pittsburg, respectively, among those who are engaged in skilled labor, 60, 70 and 75 per cent. are men of foreign birth. This is a fitting sequel and the logical result of the proscription of apprenticeships in this country by organized labor. Where is the American, native-born or naturalized, worthy of the name, but must admit that this is a crime? It does not seem that the people of this country have as yet come to a realizing sense of what this means, or they would surely rise up as one man and demand a remedy. Do you realize that a father cannot teach his own son the trade in which he is engaged? No, I am sure you do not. It is hard even now for us who have seen the results of a generation to realize the true situation. And this tyrannical proscription reacts upon the members of the trades unions themselves, for it imposes the same hardships upon their own sons as it does upon the sons of their employers. When we carefully consider this deplorable condition of affairs, we cannot escape the conclusion that the honest and industrious men who compose perhaps the greater part of the large army of skilled workmen in America have suffered their manhood and their independence to be stultified and have subordinated their highest good to the selfishness and caprice of unscrupulous and designing leaders. There is not even the shadow of a doubt that the interests of the American mechanic, as well as those of his employer and those of the American people at large, lie in maintaining a broad-minded and liberal system of apprenticeships.

Recently, in writing on this subject I used some strong language, and I want to repeat it here. It was to the effect that it is more heinous to prevent a young man from learning a trade than it is to kill a non-union man. When organized labor kills a non-union man, that is the end of him. But with the American boy, who is deprived of the opportunity to learn a trade and who is too proud to work as a common laborer, it is different. Finding the professions and various departments of business over-crowded, or lacking the resources or the encouragement to prepare himself to carry them on successfully, he drifts into idleness and becomes a tramp on the face of the earth, and finally, as is often the case, ends his life as a criminal. Hence I repeat that in my opinion the killing of a non-union man is less a crime than the barring out of an American boy from learning the trade of his choice. The right of every young man to learn a trade should be as free as the air, and it is a reproach to the fair name of our free and enlightened nation to stand idly by and allow any body of men to dictate what our boys shall or shall not do.

I have read a great many specious articles in labor papers which seek to defend the proscription of apprentices on the part of labor unions, and it is upon such stuff in the main that organized labor is fed. As a result of all this we are brought face to face with a grave and dangerous crisis in the industrial history of our country. It therefore becomes our solemn duty to devise a remedy for this evil which will strike at its root and afford permanent relief from the unlawful and unpatriotic domination of labor unions. Despairing of an awakening on the part of the members of the labor unions themselves, to a realization of their own best interests, and to a sense of common right and justice, I am convinced that the only effective cure for this malignant evil lies in the establishment of "Trade Schools" throughout the country. I do not refer in this connection to polytechnic schools or schools of technology, or even to the manual training features of our common schools. All of these have their well-recognized place in the educational system of the country, but they are not to the purpose. I refer now to the "trade school," pure and simple. But it is far easier to see and understand wherein lies the remedy than it is to put that remedy into practical operation, for here again we are confronted by the determined opposition of organized labor. I can still vividly recall the opposition which Colonel R. T. Auchmuty met from that source, at the time when the New York Trade School was established. This opposition continued for a number of years afterwards, and I have no doubt that it is more or less in evidence up to the present time. In 1891 an effort was made to establish a trade school in the City of St. Louis, to which Col. Auchmuty promised to subscribe $1,500 a year for three years (having previously subscribed $3,000 a year for three years to the Philadelphia Trade School. We met with the same determined opposition in St. Louis, and there is no doubt that it had much to do with our failure to establish a trade school at that time. I wish to say that the New York Trade School established by Col. Auchmuty is in a prosperous condition. During the past year it had 777 scholars, the largest number in its history. I desire also in this connection to pay a tribute to the memory of Col. R. T. Auchmuty, who established the New York Trade School single-handed and alone, in the face of such powerful opposition. In my humble opinion he was a true-hearted and noble philanthropist of the highest type. There may have been men who have given more in other directions, but never any who have given more freely or in a better cause. In conversation with this good and noble man at his school in 1891, I learned that Mr. J. P. Morgan had made a contribution to the school of half a million dollars. I was curious to learn if it was a voluntary contribution on the part of Mr. Morgan or whether the contribution had been solicited, and was more than pleased to learn that the constribution was entirely free and unsolicited. This is merely an evidence that Mr. Morgan has a high appreciation of the importance and value of trade schools. Mr. Morgan's generous contribution did much to encourage Col. Auchmuty and urge on the good work which he had undertaken in the conviction that the trade school was the only salvation for the American boy desiring to learn a trade.

The Carnegie School of Technology and similar institutions throughout the country are intended to embrace a much larger sphere of learning than the trade school proper, and to those who are enabled to follow out their courses of study they are an inestimable boon. But there are thousands of American boys who have neither the time nor the means, and perhaps many, too, who lack the inclination to pursue such courses of study and yet are desirous and capable of becoming skilled mechanics and through the medium of their skill and industry would grow up to be most valuable members of society. It is a sad commentary on our civilization that the majority of such youths are arbitrarily deprived of the chance to realize their ambition to learn a trade. To such as these the trade school will be a God-send. The young man who has been compelled to forego the privilege of completing a common school education and finds himself under the necessity of speedily preparing himself to earn a livelihood, is still able and should be encouraged to study the common school subjects at a night school and to acquire a knowledge of bookkeeping and other business branches at the same time that he is learning to be a skilled mechanic at the trade school. Thus equipped he will be better able to battle with the world and to forge his way to the front than were at first a large portion of the successful business men of the present day engaged in the building trades and manufacturing industries. Some of the most successful men I ever knew were entirely illiterate, never having received any education whatever. In this I have reference to those engaged in carrying on some branch of the building business. I have heard it said that Andrew Johnson learned to read and write after he was married, his wife being his tutor.

While I have always felt the need of more education, I have never considered my business life a failure. I have been successfully engaged in business since I was twenty-one years old, and I owe it all to my being able to get a good trade and gain a start in life at an early age. I believe that habits of thrift and industry should be inculcated early in life, and a youth cannot acquire them unless he be given an opportunity.

The Hampton Normal and Agricultural School was opened in April, 1868, under the auspices of the American Missionary Association. In 1870 it was chartered by a special act of the General Assembly of the state of Virginia, and thus became independent of any association or sect. It is a private corporation controlled by a board of seventeen trustees, representing different denominations. This school was started for the purpose of providing a practical education for the children of ex-slaves. In 1878 it opened its doors to Indian pupils, and has since that time devoted itself to the training of negro and Indian youths.

The aim and purpose of the Hampton Institute was expressed thirty-four years ago by its founder, General S. C. Armstrong, and has never been departed from. It is as follows: "To train **** youths, who shall go out and teach and lead their people, first by example by getting land and homes; to give them not a dollar that they can earn for themselves; to teach respect for labor; to replace stupid drudgery with skilled hands; and to these ends to build up an industrial system, for the sake not only of self-support and intelligent labor, but also for the sake of character. There are both night and day trade schools for boys and girls connected with this school. The tuition is free and the attendance is large and the school is doing a grand and good work in behalf of these two races of people, who of all other classes are most in need of help.

In California, they have two state institutions of this same character, both located in San Francisco. "The California School of Mechanical Arts," and "The Wilmerding School of Industrial Arts." Both have regularly equipped trade school branches. The former was endowed by James Lick, a citizen of California who earned his living in early manhood as a mechanic. In September, 1875, executed a deed of trust by which he conveyed to certain trustees large amounts of property for various purposes, $540,000 of which was to found and endow this school. The execution of this particular portion of his trust was delayed by litigation, and it was not until January 5, 1895, that the buildings were completed and the school formally established.

The latter was endowed by J. Clute Wilmerding, a prosperous merchant of San Francisco, who died in February, 1894, and among other things in his will provided for the endowment of this institution in the following words: "I give, devise and bequeath to the regents of the University of California the sum of $400,000, upon the following trusts and condition, to-wit:

"To establish and maintain a school to be called 'The Wilmerding School of Industrial Arts,' to teach boys trades, fitting them to make a living with their hands, with little study and plenty of work.

"Said regents are empowered to purchase lands and erect thereon suitable workshops and places of instruction, and to equip the same with such machinery, tools, and implements as in their judgment may be necessary and proper; but I suggest to them that the expenditure for the purchase of said lands, and the construction and equipment of said workshops and places of instruction, be kept within such bounds as that a portion of said four hundred thousand dollars thereafter remaining shall be able to produce an income sufficient to forever maintain and support said school.

Hon. Anthony Ittner, St. Louis, Mo.

"Said regents are authorized to invest the portion of said funds which shall remain after purchase of said lands and the erection and equipment of said workshops and places of instruction, in bonds, mortgages or other interest bearing securities, but no portion of said fund, or of the income which may be derived therefrom, shall be used or diverted to any purpose other than the support and maintenance of said school."

These two schools are established on sites adjacent to each other, and co-operate as far as possible. Both are now in charge of the same director or principal.

The trades taught at the Wilmerding School are carpentry, bricklaying, plumbing, architectural ironwork, clay-modeling and artificial stone-work, wood carving, cabinet making, electric and architectural drawing. The Lick School is devoted mainly to the machinery trades, pattern making, model making, forge work, molding, machine shop practice, electrical construction, machinery and ship drawing. During the current school year of 1903-4 a three-story brick addition 40x90 feet was built for the institution, and all the work on it was done by the boys of the Wilmerding School. This is a complete refutation of the argument sometimes advanced by the opponents of the trade school system that the training received in such schools is not practical. It is a living monument to the wisdom and value of the system.

I wish to call your attention especially to the following language in the conditions of the trust made by Mr. Wilmerding, "to teach boys trades, fitting them to make a living with their hands, with little study and plenty of work." This statement of purposes on the part of Mr. Wilmerding was certainly not intended to underrate the value of theoretical education, nor to discourage any from acquiring it who are so situated as to be able to do so. But inasmuch as the essential purpose of a trade school is to teach boys trades, it was not his purpose to allow the institution founded by himself to dissipate and scatter its energies in the teaching of branches which belong to institutions of another kind. He therefore took especial pains to bring out clearly the distinction between book learning and actual manual training, and left no doubt that it was his purpose to found an institution devoted solely to the latter kind of instruction.

This view expressed by Mr. Wilmerding harmonizes entirely with my ideas of conducting a trade school, and in inaugurating a system of trade schools throughout the country, I would advise a strict adherence to this policy at the outset, in order that the greatest possible number of worthy young men may be afforded the opportunity to learn trades. Later on when such schools have become universal and are able to accommodate all who desire instruction in the field of skilled labor, it might be well to unite a certain degree of theoretical instruction with the training of the hand. But this is a matter of detail which coming generations must work out for themselves in the light of the wide experience which the general establishment of such schools will afford. But the crying need of the present day is for schools which will devote themselves to the training of skilled mechanics who can step out of the schoolrooms into positions or jobs in which they can at once earn a livelihood. In my opinion a trade school education, without any theoretical education at all, is far superior to the training received by the apprentice, under the apprenticeship system at present in vogue.

I confidently look forward to the time when trade schools will have become so general that no American boy with the ambition and desire to learn a skilled trade will lack the opportunity to do so. Then instead of having the trades of this country monopolized by men of foreign birth, there would be equal opportunity for all.

I hope to live to see the day when this country shall be blessed with the most intelligent, sober and industrious lot of skilled mechanics the sun ever shone upon. Such is my highest ambition and desire, and the consciousness that I may have been even in the slightest degree instrumental in bringing about such a happy consummation would be my highest reward and would inspire me with the feeling that I had not lived in vain.

There is no greater obligation resting upon the American people to-day than that of providing trade schools in which our youth may learn skilled trades, and in behalf of the American youth I hope to see this association place upon its records an appeal to the American people, and especially to men of vast wealth, to come forward in the fullness of their hearts and with the most lavish magnanimity for the accomplishment of this great and good work.

"This great industrial problem is now before us. The method of its solution has already been indicated by Col. Auchmuty and other great men, and for the completion of the task I hope and confidently believe that the wisdom and patriotism of the American people will prove entirely adequate."

Whatever else you may have in your office equipment, try and have comfort, for as the average business man spends more of his time in his office than he does in his home, it is a very shortsighted policy to spend it in the discomforts of a coop-like office.

UNIVERSITY OF PENNSYLVANIA AND ITS MANY BRICK AND TERRA COTTA BUILDINGS.

NO WHERE WITHIN the Quaker City or State have we better illustration of the favor shown unto brick and terra cotta as a building material than that which is to be seen out at Thirty-fourth and Woodland avenues. Those who view it to-day would find it a strong contrast to the earlier conditions, even so short a time back as 1887. If my memory serves me right, there were then three stone buildings of that sickly greenish hue, termed serpentine stone, a few grass plots unadorned. To-day the university has become a pride to scholars and a joy to citizens, since it covers fifty-six acres, which is well-besprinkled with thirty-two handsome buildings, covering every form of brickwork, ranging from the English bond, Flemish, Italian, Spanish and early Italian Mosaic. A campus is garlanded with many a charming corner of horticultural beauty and broad spreading shade trees, lending an inviting spot to the senior or junior varsity man.

There are memorial tablets and memorial towers, statues, fine halls and spacious athletic grounds, the whole embowered in such a wealth of surrounding beauty as to make it impossible to believe that it is still within the shade of Billy Penn's hat.

The sudden stir and awakening in the university began about ten years ago, and was due to the energetic application of the late Dr. William Pepper, who, as its esteemed provost, left no stone unturned from which he might enrich the treasury of the university and raise both the dignity of its standing and the comfort of its scholars.

The Archaeological Museum, University of Pennsylvania, Philadelphia.

In 1889 there was started the handsome structure of the library, under the direction of Architect Frank Turness. Here was an absolute departure and an innovation. From the unsightly green we jumped into a bright red stretcher brick, and the order was considered a big one, "two and a half millions," and forty thousand dollars' worth of terra cotta, also red, with red Spanish tiles. The students said "it made them thirsty," and the public was undecided—they knew not whether to condemn or admire—but it settled down fairly well among the green trees. Next, however, came the laboratory of hygiene, and in this some modification in color was obtained, partly through the agency of the old Peerless Brick Company and the Eastern Hydraulic Company. The Wistar Institute began to rear its walls along in 1893, and at a cost of $250,000 a new building was added, quiet in its architectural lines, dignified in its tone and color scheme.

Buff brick and terra cotta had gained a footing, and under the driving genius of the late Architects Cope and Stewardson, its power and charm soon evidenced the fact that the old stone buildings would soon be eclipsed. The finest designs emanating from the architectural boards, with the supplimental finish of the terra cotta modelers, soon gave the touch that rendered the whole symphonic and a charm.

Owing to the indomitable energy of its provost, money poured into the coffers of the treasury, until it was approximately estimated that there was at its disposal not less than $10,000,000. Over such rich soil anything or everything would grow. Two years later and the handsome walls of the chemical laboratory, the gift of the Harrison family made another grand notch, speaking loudly of the wonderful co-operation of the two friendly powers to be. In stretcher brick and hard, in hollow bricks for flooring, the walls were reared ornamented by a simple line or detail of terra cotta, age and fire resisting, the architects said, and so far their words are true, for no place has been so signally exempt from fire as these buildings.

From the Universities of Oxford and Cambridge, England, the best plans were studied, and slowly there seemed to arise on those broad stretching acres, every department incidental to the hygienic well-being and the athletic and mental training of our youths. Dr. William Pepper also built the hospital, which, with its embellishments, cost $100,000.

An Entrance to the Archaeological Museum, University of Pennsylvania, Philadelphia.

The climax seemed to be reached, however, when it was announced that the museum of arts and sciences was completed one year later, under the joint inspiration of the Architects Frank Miles Day and Wilson Eyre. This charming structure gave tone and character to the entire buildings around it. From its massive walls of the finest selected hard brick, studded with a Mosaic of choice selected quarry marbles, onyx and Turks gilt, there lay an enchanting admixture of the possibilities of what may be done with brick. Between the iron wrought gateway and the main portal of the building there is a pool, seductive in its shady depths, part covered with the Victoria Regina, red, white and yellow lilies, under which the goldfish sport, and left or right there exists a scene of dignity and learning.

Now, there is being completed the handsome edifice of the gymnasium hall. This is nearly 240 by 80 feet, extending its frontal directly opposite to the red brick building of the dental hall. This alone took up over 2,000,000 brick from our downtown yards, hard brick and repress, all assorted, or the best that could be culled.

Under the administration of the present provost, Charles Custis Harrison, much has been done through his earnest agency and generosity, since he has donated over $1,000,000. The dormitory system, fostered by his able mind, has now matured, and there exists a fine range of buildings, erected at a cost of over $600,000, with a beautiful chapel and dining hall, the whole incorporated with a system for the comforts of freshmen and seniors second to none on this side of the Atlantic.

Wherever you turn, north, east, south or west, over the sixty-five acres of finely laid-out grounds, the sight will charm the eye of any and every brick man that ever visits the Quaker City. For surely there exists nowhere within these portals so charming an illustration of what depths may be obtained from an architectural standpoint of the clays, rich in their different treatment, satisfying in their joint result.

The archæological museum, which formerly occupied the upper part of the library hall, is now displayed in its fine building south of Spruce street. This contains one of the most interesting collections of its kind in the United States. The collections are extensive in American archæology, and the illustration is rich in the remains of the extinct Babylonian and Egyptian civilization.

From 1872 when the library contained but 3,000 volumes, it has taken an immense stride, and now the university counts over 200,000 bound and unbound books and rare pamphlets. The imposing front of the department of law, situated at Thirty-fourth and Chestnut, is the last to which the pen turns, and here is another monument, graceful in its lines as a poem or song, from the rough throat of a brickyard.

W. P. Lockington.

VALUABLE POINTERS FOR THOSE WHO WILL VISIT THE WORD'S FAIR.

IT HAS BEEN said, and truly said, that this, the World's Fair year, "All roads lead to St. Louis." We may add that all these roads will be much traveled during the ensuing months, for the attractions at the great Exposition, the greatest that the World has ever seen, will draw vast numbers of people to the city at the west end of the famous Eads bridge. When it is remembered that life at the Fair is strenuous, and that to even view its chief wonders and stroll casually through the main buildings will prove wearisome, while to attempt to inspect the art treasures gathered from all portions of the Old World and the industrial appliances and products of the up-to-date peoples of the earth, with which the immense buildings are filled, will tax the strength of the vigorous to the limit, those who travel from distant points to the great show should plan in advance for the most restful trip possible, that they may arrive in a frame of mind and condition of body that will at least enable them to start fresh on their trip through the Wonderland, for such it is. Much good advice might be given relative to the importance of securing the utmost comfort in trveling. A volume might easily be written in this connection, though for those coming from Eastern points, Michigan, Ohio and Indiana, all this may be condensed in a very few words, viz: avail yourself of the luxurious through service of the

PENNSYLVANIA VANDALIA SHORT LINES.

St. Louis is the Western terminal of this great system, and with the usual foresight which characterizes the representatives of the *Pennsylvania Short Lines* they have provided special through car service from all the chief cities on their lines and from the principal Eastern points. It goes without saying that this service will be the best known to modern railroading and will afford patrons every possible comfort. A series of folders and booklets have been issued by the Pennsylvania Vandalia Short Lines, giving full information in regard to time of trains, excursion fares, stop-over privileges, etc. Also, many valuable pointers in regard to hotel accommodations at St. Louis, and other matters of equal importance to World's Fair visitors. These can be obtained from any Pennsylvania passenger and ticket office, or by addressing W. W. Richardson, Assistant General Passenger Agent, Indianapolis, Ind., who will take pleasure in affording every possible assistance, having by years of practice acquired the confirmed habit of serving the traveling public efficiently.

Written for The Clay-Worker.

THE COLORED CLAYWORKERS OF THE FAR EAST.

PROBABLY THE MOST curious colored clayworkers of the world are in the Orient. The writer had an opportunity to visit the Japanese Empire last spring, and although the war was about to begin, the industrial pursuits were not slacking at all. In the line of clayworking, I found considerable activity, but still with the ancient apparatus of the forefathers. The Japanese have made but little progress in the way of introducing new machinery and mechanical appliances for clayworking. There is without a doubt a liberal field in Japan for the introduction of modern designs of clayworking devices, and no doubt the same will be taken advantage of in due course. The Germans and the Spanish have at times introduced a few types of clayworking apparatus, but most of it is crude, out of date, clumsy and poorly erected. The Japanese are very industrious clayworkers, and with the hands and a few pieces of moulding sticks manage to turn out some very unique clay articles. The Japanese are fond of colors, and the colored clays of the lowlands are selected. If the clays lack the desired shades, the workmen proceed to color them. The use of common dyes of indigo and logwood, both of which are obtained from the country, is common. The natives are resorted to to collect the dyeing materials, and then the clays are worked in great vats in the earth, together with the dyeing ingredients. These ingredients include some of the fantastic shades. They are brilliant reds, yellows and blues. Many of the clays are naturally colored, and these are utilized in their original condition. Some of the crude devices used by the Japanese in clayworking are exhibited in the cuts.

CLAYWORKING APPARATUS IN USE.

In Figure 1 we show a sketch of one of the testing schemes of the Japanese. At *a* are two blocks of wood or stones on the top of which is a section of a tree trunk. The tree-trunk affair is worked down smooth, and a clear surface is presented on which to handle the clay specimen. The workman squats upon the ground near this device and works at the sample until it is in proper order for drying, baking and testing. Figure 1 at *b* is the oven of native design, employed for baking clay articles. It is a great oval-shaped affair and the fire is built within the channel. There is a smoke outlet as shown. After the fire is well under way the channel is closed. The crudest of tools are in service in the clayworkers' yards, as may be judged by the models, Figures 2, 3 and 4. The tools are hardwood and are cut out by the workmen themselves. They thereby have the advantage of making a tool to suit their peculiar needs, but these tools are exceedingly cumbersome and the workmen would gain time and save energy if provided with the modern designs of American tools. For the purpose of working fields of clay, prepared for the purpose, the drag device in Figure 5 is used. Two to four animals are attached and the points that project are caused to drag through the clay masses and not upon them by crushing, tearing and grinding the same. Often these are hauled over the claybeds by men or boys. Another form of the harrow-like device is exhibited in Figure 6. This is made with the center log, with cross-pieces, to which are pinned the points. The affair is very similar to a common field harrow. Figure 7 is a drawing of one of the odd forms of clay molds used by the Japanese. The mandrill is represented by the dark portion and the outline by the parts *c*, *c*. The Japanese make some very unique and useful articles with their ancient ways of working the colored clays.

PIT WORK.

In the processes of clayworking in Japan, the workmen resort to some odd practices. In order to avoid the burning or excessive drying and cracking of the clay in process of manufacture, it is the custom to spread mats over the same when the sun is at its greatest heat. Considerable of the working of the mass of clay is done with the bare feet of the workmen. They jump into vats of the clay and tread upon it industriously for hours. One of the vats for this service is shown in Figure 8. There is an excavation made in the earth about as deep as the waist-belt of the treadmen. This evacuation is marked *d*. There are some boys to cast the clay into the vat, sprinkling in the necessary water or dye liquids, and remove the clay as fast as worked to

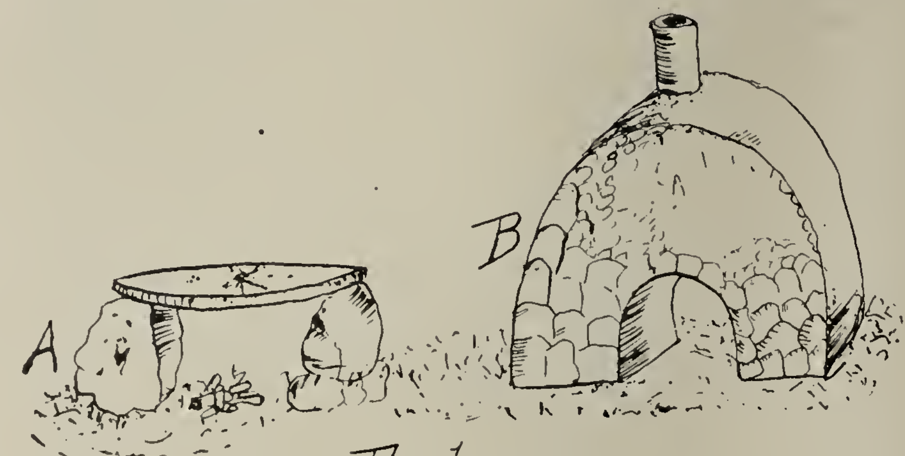


Fig 1

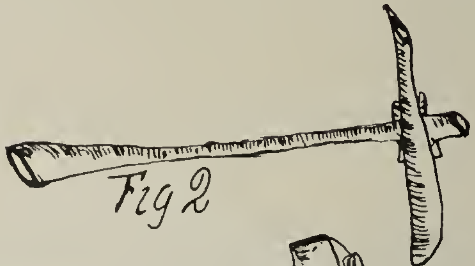


Fig 2

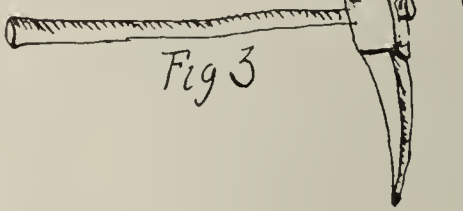


Fig 3

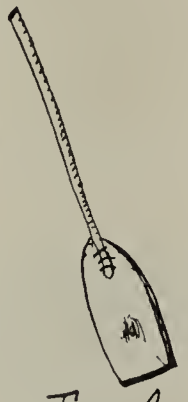


Fig 4

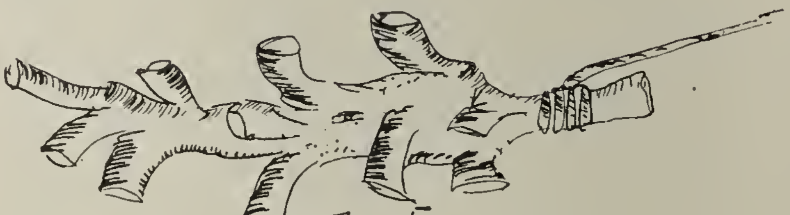


Fig 5

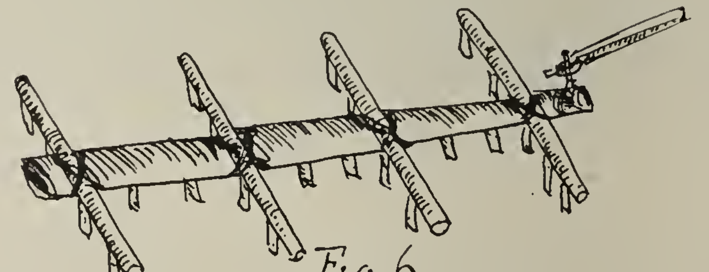


Fig 6

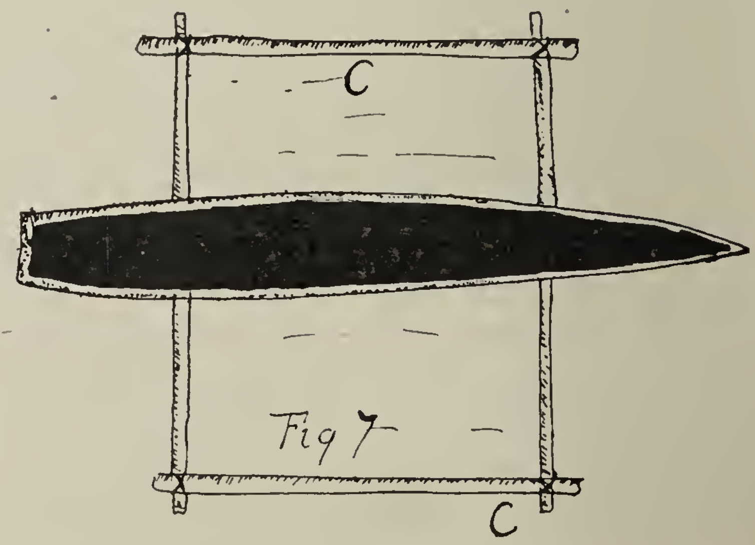


Fig 7

sufficient degree. The clayworks of the country produce pipes of varied design, some of which are crude, while others are of artistic finish. One of the roughest of pipe systems is shown in Figure 9. The unions for the pipes are merely enlarged portions of the same work. The union is adjusted over the pipe-joints and cemented with the clay. Often there are bindings of native ropage to assist in sustaining the walls of the pipes. Pipes intended for interior work are of the common clay shades. But it is the ideal of the Japanese to have colored pipe lines for exposed portions. Consequently one sees varieties of the pipes in different shades. Some of the tints are derived from the dyed colors in the clay, and others are simply painted pipes. The Japanese artists work out some very attractive designs in the brilliant colors of the Orient.

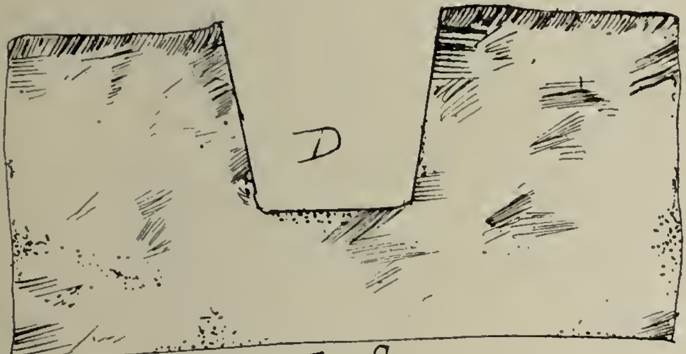


Fig 8

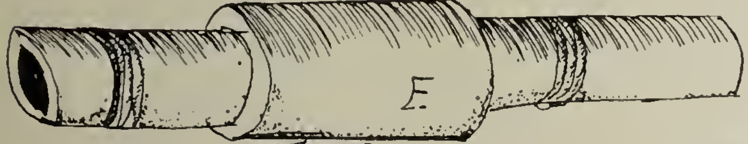


Fig 9

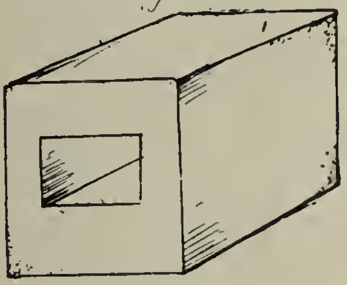


Fig 10

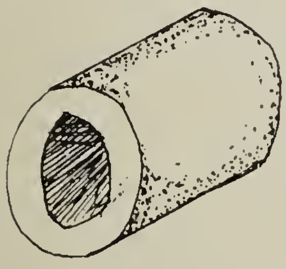


Fig 11

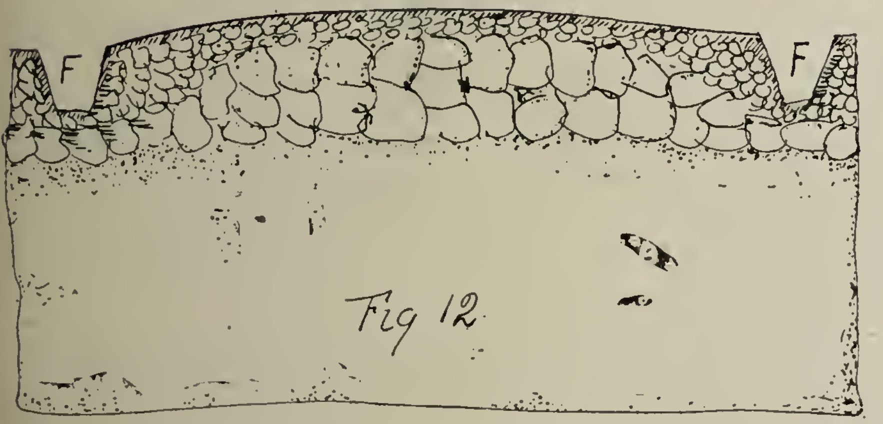


Fig 12

Figure 10 is a drawing of the square description of pipe used in some sections of the empire. This style of clay pipe is moulded almost entirely by hand. Much patience is exercised by the workmen, and as their remuneration for a day's wages is small, the owner of the clayworks seldom does any driving.

The steady, patient, jolly-faced little Japs work in the clay-yards day in and day out for a few cents a day, and seem satisfied with their lot. They hum, sing and chatter constantly. They throw clay balls at one another and have great fun. Still they accomplish considerable work in the course of the day. Figure 11 illustrates the form of the cylindrical pipe system employed for the water works of portions of Japan, in which one joint unites with the other in a continuous line, and the line is packed within a clay mass encased within wood or stone layers. A rather complicated system of piping results, but as a rule it carries the water or sewerage effectively.

CLAY AND STREET WORK.

The Japanese are wonderful street pavement makers, in that they sometimes produce in the paving intricate designs. I saw some street pavings in the suburbs of Nagazaki in which the work appeared to be inlaid. Upon examination I found that the paving was indented with scrolls, angles, curves, etc., with mortises. The work had been done by using mortising tools, and the mortised places were filled with clay pastes of differing tints. Some of the designs thus worked out presented very attractive appearance. The system of roadbed making with the clay products as utilized in Japan is exhibited in the sectional illustration in Figure 12. This consists first in clearing the road to a depth of about two feet. Then the heavier stones are placed in an even position the full length and width of the road, leaving ditches (*f*, *f*) on either side. Then the smaller stonework is placed on and trumbled with pounding devices worked by hand. Next come the layers of smaller work, such as siftings, sands and the like. On top of all the clay is cemented. The roadbed is rolled with stone rollers and pounded with the weighted trumblers.

It is while working the surface of the road that the finishing designs are worked into the paving. For the common roadbed, just a plain thickness of the clay is put on and rolled. For the fancy roadbed of the park or the arched place, the roadbed designers in clay are called in and the surfacing is decorated with the colored clay products. The figures often include serpents, and various animals of ferocious appearance.

"TRAVELLER."

CLAY EATING.

A Curious Habit which Prevails in Many Localities—Result of a Traveler's Investigation.

A TRAVELER WHO has been studying the country traversed by Xenophon on a forced march from Babylonia to the Black Sea has noted the effects on the peasantry of eating earth mixed with flour. The Armenians, being in the majority, are not allowed to have arms in their possession; the Kurds, who are nominally Mohammedans, are permitted by the Turks to plunder and oppress their Christian fellow citizens at their own sweet savage will; hence abject poverty among the Armenian villagers, who scarcely keep body and soul together. It is these unfortunates who are massacred every now and then when some ambitious Osmanli or Kurd wishes to earn a decoration for his prowess in suppression of a fictitious insurrection. It is they who literally "eat dirt."

The use of various clays, mixed with flour, or entirely pure, does not, however, mean in every case that hunger was the patentee. Some of the most unappeasable clay and earth eaters seem never to have had the spur of necessity to drive them to such perversity. On the Amazon and Orinoco the tribes lay up during the dry season a store of slightly roasted balls of potter's clay for eating when the rainy season stops the fishing. They enjoy crunching these clay balls between their teeth at any time. The Eskimos, the Otomacs, the Javanese, the Bengalese and other people of India, consume clays of different kinds, generally a soft, smooth, fatty sort, just as we eat candy; especially do the women and children indulge in the habit. Scientists have imagined that geophagy is a disease, a perversion of the human mind and sense of taste, because in many cases geophasists pine away in consequence of too much of their unnatural food. But the facts are not tragic in the case of Spanish and Portuguese ladies who munch the thin, brittle potsherds of water colors, or the patients who used to be fed on the costly little biscuits of clay from Lemnos, Malta or Cyprus, in the firm belief that they would be cured of certain maladies thereby.

Clay eaters in the southern part of the United States are supposed to have learned the trick from the negroes of the west coast, who are "convinced" eaters of the soft potter's clay. The monotony of their food may have something to do with the habit, and possibly certain chemical elements are supplied to the stomach in this crude way; but it seems more sensible to believe that such habits are similar to childish tricks, like chewing gum, the eating of nuts in endless quantities, the use of tobacco for chewing. Most children, if left to themselves, will try any peculiar clay by putting some in their mouths.

Clay eating is so widespread among savage, semi-civilized and advanced peoples that it cannot be considered so abnormal as it once appeared. Like the bark ground fine which the peasants of Sweden and Finland mix with their rye and buckwheat flour in times of famine, the use of soft clays, when kneaded with nutritious food, does not destroy the health. It is only when it becomes a passion that the victim of this trick suffers, and often dies.

Our bakers should not say, "Go to, we shall make the loaf heavy and not unsavory, with cunning clay," nor imagine that alum, that magical stuff, does not harm; neither should the candy makers load their wares with terra alba or other earths or clays. There is a great need of watchfulness over a staple article like bread, lest the ingredients meant to lighten and whiten it should be unhealthful and injurious.

LAND DRAINAGE

BY J. J. W. BILLINGSLEY

WHY TILE DRAINAGE IS NECESSARY.

FIRST OF ALL, and absolutely essential, is a well-drained soil; if not naturally so, then by laying tile, or a good substitute. A crop may be grown on water-soaked land, but never a good crop, for it cannot be got in early, and the soil is never in good condition, and there are other drawbacks, such as coldness of the soil, the running together of the soil, and a clammy condition when wet, and cloddy when dry, and no chance for clean, mellow cultivation at any time. A well tile-drained field may be plowed early in the season and is readily made fine and mellow. The good husbandman will have full control of such a field during the season and will grow a remunerative crop. Therefore, drain sufficiently, as a groundwork for successful farming.

Construction of Open Drains.

Open ditches constitute the primary steps in land drainage. With all the objections which may be urged against open ditches, they are indispensable in any system of land drainage embracing a large area of land, when other means are impracticable.

An open ditch should seldom have a bank slope of less than one-half horizontal to one vertical; and a greater slope will usually be better.

The bottom of the ditch may be narrowed down to two feet, and wider if the drainage area requires it.

The depth of open ditches should be from four to ten feet, depending on the fall and lay of the land. The ditch should be deep enough to furnish a good fall to the latterals and deep enough to raise the discharge of the latteral drains from one to three feet above the bottom of the open ditch. The latteral tile drains should be kept as much above the bottom as possible, so as to make the discharge of water free from obstruction.

An open ditch should be made from one to two feet deeper than may otherwise seem necessary, and in so doing provide against the reduction of depth which subsequently occurs.

Open ditches should be cut as straight as practicable, and on the lines dividing real estate when at all practicable, which will depend on the topography of the country whether it can be done In some sections of country, where the land is quite undulating, the ditch must necessarily be crooked. In a level country the construction of the open ditch may be in straight lines. Changes in the course of a ditch should be made with neat curves. Any change in the course will retard to some extent the flow of the water, and the force of the water striking against the side of the ditch will cut away the bank to some extent, depending on the curve and earth conditions.

The closing of open drains, where it is possible to do so, will come with the years, on account of the many inconveniences —in the cultivation of the land, the need of frequent repairs, the waste of land, a harbor for weeds, bushes and briars.

There are many open drains that can be put underground in tile that are judged to have too large a flow of water, when in fact it is not only possible to have the water flow through large tile, but the tile will not need to be as large as some are disposed to think. Any one who has never seen the water flowing from a tile sixteen inches in diameter will be astonished to see the amount that flows out when the tile is only carrying two-thirds of its full capacity. A tile two feet in diameter, running two-thirds full, is a veritable little river, yet there are tile made and used that are three feet in diameter.

There are few open drains that run too much water to be put underground, and it is very desirable to have them put below, when it is possible. The open ditch bears away the cream of the soil at every recurring rainfall. Save this waste of fertility and add to the saving of the land, and greater convenience.

Will do More Tile Draining.

A well-to-do farmer, a short time ago, said to the writer, "The present season has been an eye-opener to me. I have done a good deal in the way of tile draining my land, and thought that it would hardly pay to do more, but this season has demonstrated to me not only the benefits to be had from drainage, already done, but the need of doing much more. My drained fields have been ready to plow a week in advance of the land not drained; besides, the tiled land is easily put in good condition for planting, while I have to do a great deal of extra work in the way of rolling and dragging the land not drained before I get it into anything like as good condition for planting. I am almost disgusted with myself that I did not continue to drain all of my land."

But how about the crop prospects for the present season?

"As to that the drained land is far ahead of the other—it looks now that it would almost double the yield. I mean to do more tiling this season. I went the other day and engaged my tile. The factory is behind on orders, so I will have to wait a little, but I shall not be caught this way again."

Didn't Have Tile Enough.

A few days since we visited the tile works of M. M. Hindman, Lawrence, Ind. We found but few tile in the yard, though they are busy making and burning.

How about the trade, Mr. Hindman?

"Didn't have tile enough; not near enough. I don't remember a better season to sell. Men have come here in wagons a dozen miles or more, and had to go back disappointed. I didn't have the tile. I shipped in a carload or two of tile to help my trade."

How about the season for making tile?

"About the worst in my recollection. The tile that I am setting in the kiln have been in the dry sheds for two weeks, and they are not dry enough. The air is so laden with moisture that the tile do not dry; besides, it takes a day or two longer to water smoke, and have to go slow, and we can't help it. Quite a number of farmers are waiting on me for tile. Such a pressure makes me nervous."

The Ends not Smooth Yet.

I is too frequently the case that in visiting tile factories we find the tile rough at the ends—inside and outside, before and after being burned. Particularly rough on the inside edge of the tile; the wall of the tile at both ends often has many cleavages, and after burning the tile are not improved. It is but reasonable that such rough edges will greatly retard the flow of the water. Such tile should be one-third larger to have the same capacity of tile that are smooth.

Just where to locate the trouble is not so easy. We have seen the same trouble in the use of all kinds of cut-offs. It may be worse here; the clay is poorly tempered—unevenly tempered. Since we come to think about it, we think that the unevenness of the tempering does have something to do in causing this defect. If so, it is plain that more attention should be given to tempering the clay. In fact, clay well tempered works better every way.

A Man Who Wants to Sell.

Once upon a time we visited a tile factory that had been advertised for sale for a year or more without finding a buyer. After looking it over, we could see, or thought we could see, why it was for sale, and why it did not sell. The general disorder about the factory was discouraging—even to the owner, to say nothing of the trade. No one having any enterprise in his makeup would want to risk the possibility of a paying business with such surroundings to begin the undertaking.

Broken bits of machinery, poles, old lumber, sticks of wood, piles of vats, doors off of their hinges, the fence around the yard in a dilapidated condition, kilns needing repairs, drying racks askew—if tile were straight when set in it did not seem probable that they would come out so—no order observed in the ricking of tile on the yard, and hard work to get to them, all of which is discouraging to both sides of the trade. An orderly business is stimulating to trade.

A purchaser of tile is encouraged to buy more tile when there is an air of prosperity about the factory. If we had a factory to sell, one of the first things that we would look after would be to put everything in order, if not already so. Give it a sightly appearance; make it look as if it had in the past contributed to the owner's prosperity. Burke has well said that "Good order is the foundation of all good things."

Stone Drains.

The most practical method of constructing stone drains is to lay two rows of ordinary cobble stones, wide enough apart in the drain to let the water flow fast enough; then lay flat stones across, resting on the side rows, fill the ditch with stones to within a foot or fifteen inches of the surface; then complete the filling with earth. A drain constructed in this manner will do good work for years, but will become clogged and fail to work sooner or later, and will need to be replaced with a tile drain. A stone drain cannot be made close enough to keep the sand and gravel from washing in and clogging the ditch. It is better, far better, to use good drain tile, large enough to do the work well.

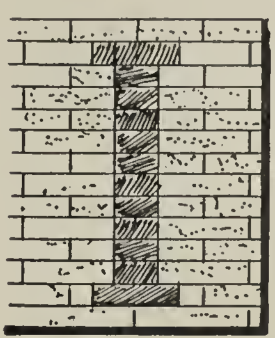
Cost of Drainage.

We are frequently asked what it will cost per acre to thoroughly underdrain. It is difficult to answer the question, for conditions are so different. The cost of securing an outlet mav be little or much. The number of rods of drains needed per acre may vary from twenty to sixty, the cost of digging from 25 to 75 cents per rod, the cost of the tile will vary with the size of tile used. If the average cost of digging is 25 cents per rod, if the average cost of the tile is 25 cents per rod, and the number of rods required to the acre is thirty, the cost is $15.00 per acre. The cost will vary as conditions vary. Very few have realized the profits to be obtained by thoroughly draining the farm land they possess. The tendency is to farm much instead of to farm well.

WORLD'S FAIR NEWS NOTES.

Twelve acres have been allotted to the Aerial exhibit at the World's Fair. A fence thirty feet high encloses the site. The stockade for the airships is 88 by 180 feet. Doors at each end permit the entrance of the largest airship. A 100-ton gas generating machine is being installed, whch will furnish gas for contestants free of charge. At present there are 55 entries in the contest, which offers $200,000 in prizes.

PERFECT COLOR OF BRICK.



IN THE brick industry the endeavor has always been made to produce bricks of the purest color possible and the effort to accomplish this is all the greater when they are used in a building as front bricks. There can be no doubt that the human eye has always regarded with especial favor the objects that presented a clean and true appearance and this predisposition has been continually increased by the increase of culture. Wherever bricks are only used for backing up, or they are to be covered with stucco, the color is not of so much importance, inasmuch as they will not be seen in the completed building, but this statement that the color in such case is not of much importance is only true so long as the uneven color is not due to the presence of soluble salts in the bricks, which might endanger the permanence of the building. Such goods are, naturally, not desirable neither for the outer walls that are to be stuccoed, nor for interior work.

It is not surprising that the remarkable development in the technics of brickmaking during the latter half of the past century has resulted in continually greater demands for purity of color in brick. Architects, too, have done much in this direction, though before this period purity of color was valued, as is proved by the difficulties which were experienced in the early years of the continuous kiln to produce satisfactory goods made of limy clay. The sole objection to the bricks was the piebald, maculate appearance. Great sacrifices and efforts were necessary on the part of the inventor of the continuous kiln and also of brick manufacturers, before the causes of the discolorations of the ware burned in this most economical burning apparatus could be discovered and removed. This fact shows us clearly how much importance was attached in earlier times to a good and even color.

If we consider the manufacture of brick we will find that, broadly speaking, there are three main causes for their discoloration. It follows from this that these discolorations may exhibit a very considerable variety, both in their intensity and their character. As is seen from the above the discolorations in bricks are regarded in the first place as defects in sightliness, but it is also possible for the causes of the discolorations to have harmful consequences and the bricks may become a weakness in the wall or have a destructive action upon the stucco with which they are covered. In such case of the possibility of serious damage the chemical composition of the discoloring elements and their quantity have to be considered. These hurtful influences can, however, be removed by a sufficiently hard burn.

In the raw materials it is especially the soluble salts that produce discolorations. The soluble salts have their effect either through their remarkable property of crystallizing, or through their influence upon the color of the ware. Chief among the first are the sulphates, which play a principal part in discolorations, especially the sulphates of lime, magnesia and the alkalies. If these salts are contained in the clays they become dissolved by the water that has to be added for mixing the clay and, on drying the molded goods, the salts are carried to the surface, where they are afterwards fixed by the process of burning and so produce the discolorations. Among the substances that strongly affect color are the vanadium salts, while these have their effect upon all colors their action is more marked upon light colored bricks (white and yellow) than upon red burning bricks. The same as in the case of the sulphate salts, water plays an important part in the discolorations inasmuch as it dissolves the soluble salts, which are carried to the surface in drying. Where discolorations are produced by sulphates these are seen immediately on removal from the kiln after burning, but it is not so in the case of vanadium salts, which only appear when the bricks affected by them become wet again after burning, when they present themselves as a yellow to greenish yellow discoloration.

The soluble sulphates may be formed in a clay when the necessary conditions are present. The formation of soluble sulphates will always result when pyrites are present, also combinations of iron and sulphur in other forms. If such a clay containing pyrites comes, when in a moist state, in contact with the air, oxidation takes place, accompanied by the formation of an iron oxide sulphate, a salt which is just as capable of producing discolorations on the dried brick as can be done by the other above mentioned sulphates. If the clay, in addition to the iron sulphide, contains lime or magnesia carbonates, or other lime and magnesia compounds, then under these conditions, sulphates of lime and of magnesia will be formed, which will cause exactly similar discolorations to those produced by sulphates that were already present in the clay before being dug out of the pit. Besides these sources the sulphates may be introduced to a clay by the water which is used for soaking it and making it plastic.

The formation of the sulphates, with the resulting discolorations, can under the given conditions, also be brought about during the drying process and the slower the process of drying has been the stronger will be the objectionable features, for not only are the conditions then most favorable for the formation of the sulphates, but the longest possible time is given them, after being dissolved in the combined water, to creep to the surface of the brick.

It is well known that the drying off of bricks, as of all clay goods, consists of two stages; the first where the bricks become air dry, the second, frequently called water-smoking, in which the temperature is increased sufficiently to drive off the mechanically combined water. Every brickmaker knows that poor colored bricks are the result if there is an interruption of the water-smoking process, or if this has not been properly carried out, therefore every burner, whose ambition it is to produce a perfect color, will see to it that the water-smoking is most carefully carried out and in a workmanlike manner. Besides the formation of sulphates during water-smoking we have to take into account the effect of ash and particles of fuel that are carried by the draft, which stick to the damp brick and are burned on to it.

If our troubles are due to the presence of sulphates in the clay, or their formation during water-smoking process, we must also bear in mind the effect of the sulphur contained in the fuel. Even during the burning of the bricks these discolorations may be produced. It was the introduction of the continuous kiln that enabled the behavior of the clay in this respect to be explained. While in the common kiln the whole process, from the commencement of drying off, or water-smoking to the finish of the burn was one and the same firing, starting at a low temperature and increasing to full fire; in the continuous kiln the two operations of drying off and of burning are carried on side by side, or else there will be an interruption in the continuous operation of the kiln. It was this that first called the attention of the inventor of the continuous kiln to the necessity for care in drying off. The difficulty was found to be much greater in producing good colored ware from certain kinds of raw materials. It is true that experience has taught that by burning very slowly clean colors could certainly be obtained, but this slow burning did away with the advantage of the continuous kiln. Finally the conclusion was reached that perfect colored bricks from limy clays, which were the materials in question, could be obtained by burning, alternately, with a reducing and an oxidizing fire.

The above indicated causes for discolorations of the surface of brick can produce the defect singly or in combination. If all three causes are at work together the difficulty in overcoming them will, of course, be increased. In general it may be said that a continuous kiln demands more care to obtain the desired result than does the common kiln, but in whatever form the difficulties arise we can, with technical knowledge master them. To do this, which is our great object, the cause of the discolorations must be exactly known, in order that the right remedy may be applied.

If soluble sulphates are present in the clay then the remedy that practice has, up to the present time, shown to be the most successful, is the addition of barium salts. It is true that other means have been proposed, but these have only been temporarily employed and have soon gone out of use, however advantageous they may have seemed at first, we will therefore not take any further notice of these methods, but confine ourselves to the use of baryta for our object. Among the barium salts that have been used to ensure a perfect colored brick the carbonate of baryta is preferred and has been in general use for a number of years. In the first period of the use of baryta the natural stone, known as witherite, was used in a finely ground state, but later the use became more and more general of the artificial preparation, the barium carbonate. There can be no doubt that the prepared material is better than the natural stone. It is purer and it is produced in a much more finely pulverized state than it is possible to grind witherite. The principal reason why the artificial product so soon found favor over the natural stone is that the artificial is unquestionably more effective. The quantity of barium carbonate to be added to the clay should be in proportion to the sulphates contained in it, but in general twice as much is added as is absolutely necessary. Experience teaches us that the baryta had better be added to the clay shortly before it is worked up and molded. Besides barium carbonate, barium chloride has been proposed and has come into use. Many works employ both these barium salts together.

If large quantities of soluble salts are in the clay, as for instance, gypsum distributed in nests of crystals, then, if we wish to get a perfect colored ware, the clay must be slummed. We then only have to add as much baryta as will be needed to neutralize the gypsum contained in the water left in the clay. The addition of baryta is also necessary if the clay contains components that go to form gypsum, or any other sulphate, as in the case, referred to above, where pyrites and calcium carbonate are present in the clay. Above all rapid drying is of advantage in the production of a perfect colored brick. We should therefore always endeavor to dry off as quickly as the material will permit, as rapid drying gives us more certainty of good color than slow drying. All bricks should be set in the kiln as dry as possible and this equally applies to all clay ware, then it must be carefully and understandingly dried off.

Although as a rule, bricks are burned in an oxidizing fire, in order to get a good color in ware made from a limy clay it is better to use, alternately, a reducing and an oxidizing fire. In the common kiln this alternation is unconsciously produced by the feeding of a quantity of fuel into the furnaces, then by the fuel burning clear. When the fuel is fed in a heavy smoke and vapor are produced which have a reducing effect, while as the fuel burns out an excess of air enters. The continuous kiln operates, contrary to the common kiln, with a constant and strongly oxidizing fire, so that if a reducing fire is needed we have to produce this artifically. A reducing fire in the continuous kiln is obtained by closing the flue dampers and at the same time feeding in fuel. As a rule this little dodge in continuous kiln practice is employed towards the end of the burning of a chamber and we form a reducing fire as often as our experience teaches us is necessary. This is mostly two or three times. Each reducing fire is followed by a clear burning oxidizing fire, usually at an interval of fifteen or twenty minutes. Every fuel contains some sulphur compounds, which form, in burning, sulphurous acid. The sulphurous acid, in the presence of an excess of oxygen in the fire, combines with the lime in the clay to form lime sulphate, which brings about the discolorations in the ware. On the other hand a lime sulphate, in the presence of reducing gases, becomes a sulphide, which is not permanent in an incandescent heat, but separates into lime and sulphurous acid. In a reducing heat there is a disintegration of the previously formed sulphate of lime, the liberated sulphurous acid is carried away and perfect colored ware is the result.

The quantity of sulphur contained in fuel varies. The smallest quantity is found in wood; there is more in lignite, but above all we find it in the different kinds of coal. This explains the fact that when using wood as fuel we can get a better color than with other fuel, while for lignite and still more for coal a great deal more care and attention in the management of the fire is necessary if we expect to get a perfect color in our brick or other ceramic product.—*Deutche Toepfer und Ziegler Zeitung.*

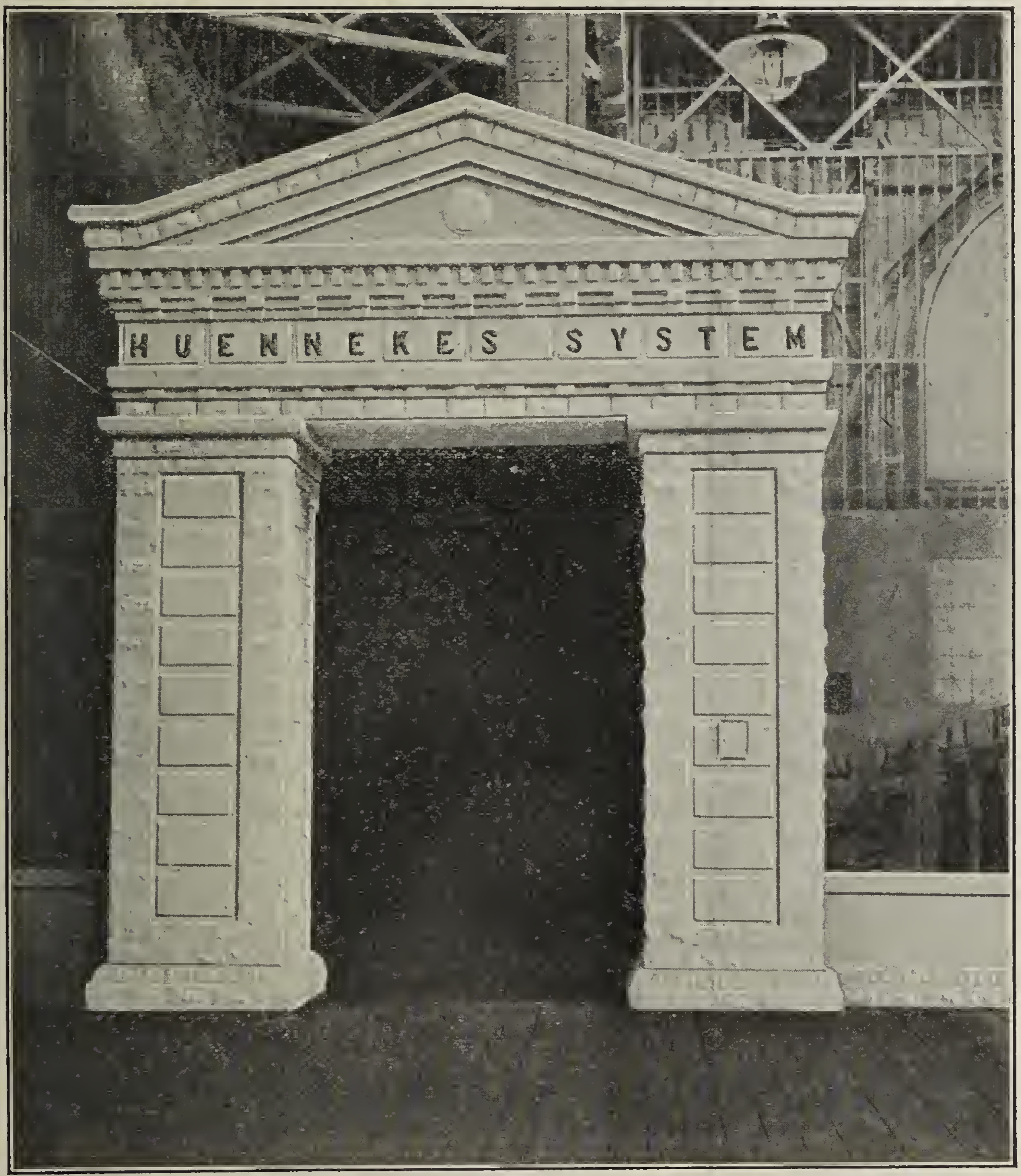
Written for The Clay-Worker.

THE HUENNEKES WORLD'S FAIR EXHIBIT.

A Display of Sand-Lime Brick Representing an Outlay of Several Thousand Dollars.

The EXHIBIT OF the H. Huennekes Co. is one of the most complete and imposing in the Department of Clay Industries at the World's Fair. A general view of this display is shown in their ad. on page 7. The accompanying view of the main entrance of the exhibit gives but a faint idea of the splendid appearance of this bit of architecture, which is constructed wholly of sand-lime brick. Within their exhibit is a miniature plant, complete in every detail. It is operated by electricity and the visitor may be inducted into all the mysteries of the sand-lime process. Every feature of the work, the mixing of the material, pressing of the brick, and their conveyance to and from the steam cylinder is shown in its minutest detail. They also show a series of panels constructed of sand-lime brick made by the numerous factories now being operated, under the Huennekes system, in various sections of the country. There is a great variety of color, and the brick are of a quality which challenges the admiration of all visitors.

The exhibit is in charge of Mr. W. J. Carmichael, who is the right man in the right place. This one exhibit represents an investment of several thousand dollars, and is of itself, a remarkable evidence of the faith of the promoters in the success of the sand-lime brick.



SAND-LIME BRICK ARCH.
Entrance to Exhibit of H. Huennekes Co., Mines and Metallurgy Bldg., World's Fair.

Many claims for superiority are urged by the manufacturers of the sand-lime brick. Beyond the fact that the material is pressed in a mold the same as the dry pressed brick, there is absolutely nothing in common between the two. In the first place, according to nearly all the systems, no trace of clay should enter into the composition. And there is no burning. In place of the kiln we have a steam cylinder. The pieces, bricks, moldings, or whatever else they may be, are taken direct from the press to the hardening cylinder, where they are subjected to a pressure of about 125 pounds of steam for something like eight or ten hours and when taken out of this steam cylinder there is nothing more to be done to them, nor is any period of waiting necessary, nor process of curing, but they are ready at once to be laid in the wall.

The proportions of sand and lime used in the Huennekes system are: Sand 95 per cent.; lime 5 per cent. These two ingredients alone make up the brick. Another chemical is used, but this is placed in the steam or hardening chamber and it is asserted, plays an important part in producing the chemical rection between the lime and the sand to form a calcium silicate.

The lime is mixed with the sand while in the condition of quick lime and is not slaked first (hydrated is the word now). The hydrating is done by the addition of water. From 10 to 12 per cent. of water is used. The material when thus mixed and the lime hydrated, is stored in bins for twenty-four hours. This insures the thorough hydration of the lime. The mixture of lime and sand is then ready for pressing.

The pressure given the bricks is greater than is demanded for dry pressed bricks made of clay, though the type of press used is the same, but the frame of the machine and the steel gearing, levers, cams, etc., throughout are stronger.

As to the cost of manufacturing the brick it is said that where the sand is at hand, the lime not too far away and the price of labor, fuel, etc., is a fair average, the bricks should be made from $3 to $3.50 per thousand. The cost of the chemical, or chemicals, used in the hardening cylinder, which is included in the above price, is said to be about $1.00 per 20,000 bricks.

The natural color of sand-lime brick is like that of a light gray granite, but the bricks can be produced in great variety; red, green, blue, purple, white, black, etc., by the addition of mineral colors, at a small extra cost. The crushing resistance of the sand-lime brick has been proved on numerous occasions to be ample, as it has been shown to be over 8,500 pounds per square inch. Absorption averages 6 per cent. The Huennekes Co., whose head office is at 114 Liberty street, New York City, may well be proud of the splendid showing they have made.

Written for The Clay-Worker.

POINTS FAVORABLE TO BRICK PAVEMENTS.

THE TOWN OF SUFFOLK, Va., is beginning to get the street-paving fever worked up to a degree a little above summer heat, and in all probability we will soon have some new paved streets, which are very badly needed, in such an up-to-date and progressive town. The question now arises as to what they shall use. Some want asphalt and others are talking brick. With such splendid examples as Jacksonville, Fla., Atlanta, Ga., Birmingham, Ala., and a great many other enterprising Southern cities afford, there ought to be no hesitancy in the matter of choice of materials, for there is no question but that brick pavements are best. To his credit be it said that our city engineer is highly in favor of brick, and in this he shows very good judgment, for in my way of thinking and in what I have seen in the way of brick paved streets in over a dozen states North and West, the brick paved streets are highly in favor.

To start with, brick pavements are as noiseless as asphalt, more durable, much cleaner and easier to keep clean, also easier to repair when the street has to be opened to repair pipes, etc. It is highly in favor as a sanitary street, as it is nearer non-absorbant than any street in use to-day. It has received a black eye in some localities, simply because it was not put down right. Anything half-done had better not be done at all, and it is just as essential to put down a good sub-grade for brick as for asphalt, or any other paving material. There has been enough said already about the sub-grade, filler and expansion joints, etc., without one going into detail, yet I will say that I believe about a six-inch concrete sub-grade will make a good foundation and will prove cheaper in the long run. I also believe cement filler preferable to sand or tar, as it will keep the street nearer waterproof than any other filler. When you lay a brick street, put it down right, then you can point to it with pride in years to come.

Our city engineer, Mr. Darden, recommends hand ramming. I beg to differ with him in that; I think a street rolled with an eight or ten-ton roller will be more uniformly settled than one tamped by hand. When the rammer comes down on one end of the brick it has a tendency to lift the other end a little and the sand will crowd that way and the street will not be as uniformly settled as by the roller. There has been no contract let yet. The manufacturers of street pavers could submit samples and prices to J. H. McCary, Suffolk, Va., or to Mr. Darden, City Engineer.

H. L. J.

Forsythe Street, Atlanta, Ga., Paved With Coaldale Blocks, June, 1896.

BELLEVILLE'S NEW BRICK STREETS.

The Belleville, Ill., board of improvements has decided to construct fourteen blocks more of brick pavement. This work will include one block on South State street, three blocks on the Court House Square and ten blocks on North State street. The city council passed an ordinance July 5 authorizing the work done. Other paving on West Pearl street is under construction, but has been deferred by the board until a later date.

FIREPROOF ITS ONLY FAULT.

From an artstic standpoint the least attractive of the government buildings at Washington is that of the Pension Office, sometimes derisively referred to as "Meigs' barn," in view of the fact that General Meigs, U. S. A., was the architect of the structure.

It is said at a time when the building was nearing completion the late General Sheridan was invited by the architect to inspect it. In company with General Meigs, Sheridan went thoroughly over the structure from top to bottom without offering any comment, but when the inspection was finished, he turned to his guide and said:

"Meigs, I have but one fault to find with this building."

"And what is that, General?"

"It is, I understand, fireproof."—*Exchange.*

Written for The Clay-Worker.

THE CHICAGO SITUATION.

MID SUMMER and no kicking to be noticed in building circles in Chicago. Business is not quite so brisk as it was a few weeks ago, but it rarely is about this time, and compared to last year it is exceedingly satisfactory. The weather has been good and labor disturbances in the building trades have been most noticeable for their absence for some time. In addition to the stringency in the money market which delayed building in the fall and was responsible for an unsatisfactory lookout during the first months of the year has passed away. The month of June was a very good month indeed for buildings. The spring had been late and much of the work that is started a month or even two months earlier was opened up in the month just closed. Among financial observers it is noticed that a large amount of capital which has heretofore been largely invested in stocks and bonds is now being put into real estate and building, and this tendency, it is believed, has had much to do with the improvement of the present season over last.

According to data printed in *Construction News,* Chicago shows a gain in number and cost of buildings for which permits were applied during the past month over the figures made on the same basis last year, of 39 per cent.

In 1903 application was made for permission to erect 642 structures at a total estimated cost of $3,932,950, while during July, 1904, permits were issued for 809 buildings at a total estimated cost of $5,439,700. For the past month Chicago leads all the other cities of the country in number of permits issued. Number of permits issued weekly have run from 134 to 185.

The boom in downtown building keeps up, and shows distinct signs of being continued indefinitely. The acquisition by Otto Young of the building and leasehold recently purchased by H. G. Selfridge & Co. from Schlesinger & Mayer, gives Young practically complete control of the big State street frontage from Madison to Monroe streets, and, in fact, control of the greater part of that block which is bounded on the east by Wabash avenue. This is expected to result in the erection of a large structure in conjunction with the handsome building erected by Schlesinger & Mayer, and which will probably be used for an enlargement of the store of H. G. Selfridge & Co. The erection of such a building for this purpose was contemplated by Schlesinger & Mayer prior to the establishment of the new drygoods house to whom they sold out.

Smaller buildings are in process of erection or being planned for construction in all parts of the city, and of all types of architecture. Small apartment buildings and dwellings are going up generally.

Former Commercial Agent Van Dyke, of the Pere Marquette railroad, has resigned that position to become secretary and treasurer of the American Clay Roofing Company, organized last winter.

One of the permits taken out for a downtown building recently was that for the J. A. Patten building, at Sherman and Harrison streets. This will be a twelve-story structure of steel construction, and will cost in the neighborhood of $350,000. For the first time in Chicago, it is said, repressed paving brick will be used for the exterior finish above the granite base. C. A. Eckstorm is the architect.

Brick paving is becoming popular in and about Chicago. Maywood is following the example of Evanston and other suburbs. The Purington Paving Brick Company is furnishing the material for street improvement in paving covering an area of 31,000 square yards. Scrip.

A Typical Residence Street in Jacksonville, Fla., Paved With McAvoy Brick, Concrete Foundation, Sand Filler.

BRICKMAKING PLANTS INSTALLED IN RUSSIA.

The Henry Martin Brick Machine Company's representatives at Port Arthur and Vladivostok, Russia, have just notified the home office at Lancaster, Pa., of the completion of big brickmaking plants at both those Russian cities. They were built for a syndicate of English and Canadian capitalists. Just now there is little likelihood of such plants being operated in the near future.

Written for THE CLAY-WORKER.

FIREBRICK AT THE WORLD'S FAIR.

Exhibits from Various States and Foreign Countries—Missouri Manufacturers in the Lead.

THE FIREBRICK INDUSTRY is well represented in the clay industry exhibit at the St. Louis World's Fair in the great variety of shapes and products exhibited, and in the diversity of the districts represented. It is especially interesting to observe the great variety of shapes that are now produced by the leading manufacturers, and the new fields into which refractory goods are entering. The industry, as evidenced by the exhibits, is still in a transition condition, as while much of the material is still hand-made, the machine-made goods are growing in favor. While the reduced price of the machine made goods is largely responsible for the change, there is a noteworthy improvement being made in their quality. Whether the hand product will become a matter of history remains to be seen, but machinery has made great progress since the Chicago Exposition. The value of the exhibits could be greatly increased by the use of intelligent labels, which as a whole are deplorably lacking. This is partly due, undoubtedly to the old fogy ideas that largely prevail and act as a serious drag on this industry. Many manufacturers still delude themselves with the idea that they exclusively possess the knowledge of how to make a thoroughly good firebrick, notwithstanding the successful results of their competitors, and are afraid to put an intelligent label on their goods, lest it might convey some information.

Evens & Howard's Pavilion in the Manufactures Building.

Beginning with the East, there is a small but interesting exhibit of carefully made goods and shapes exhibited by the Presbery Firebrick Company, of Taunton, Mass. The brick are evidently machine-made, and have a good body that has a white color where not fire-flashed. They are made from fireclays from the Bloomfield Clay Company, whose mines are in New Jersey, so that New England can only claim the care and skill with which they are made.

Cyrus Borgner, the veteran Philadelphia manufacturer, has a very complete exhibit, in which the hand-made brick is especially prominent. A very full line of shapes is attractively shown as a terraced pyramid and a well-made gas retort is one of the prominent objects.

The New Jersey firebrick manufacturers are conspicuous by the almost complete vacuum that their absence has made. A few insignificant samples are shown in the New Jersey State exhibit from the National Pyrogranite Company and the old firm of Henry Maurer. How such a well-known, long established firm as Maurer, with a national reputation, can afford to be represented at an international exposition with such a pitiful exhibit is difficult to understand.

The New Jersey fireclays are far better shown and in fact are the only intelligent, properly presented series of clays exhibited at the exposition. Glass jars are shown with lump samples of the raw clay, with which are a set of raw and burned bricklets accompanied by labels, that give the complete physical chemical analyses. The information given by the labels enables the intelligent clayworker to promptly learn all about the clay, which even finished products only partially accomplishes. A model of an old fashioned clay washer also adds historical interest to the tank system of washing. Where the New Jersey manufacturers have signally failed to present the great refractory resources of this State, the State geological survey has made a very satisfactory exhibit of the clays, though this exhibit might have been enlarged with much profit.

The Maryland State exhibit presents a line of the Mt. Savage firebrick (Union Mining Co.) and while the brick are rough, hand-made samples, they are very low in iron and highly refractory. The Baltimore Brick Company also shows a full line of hand-made brick and a gas retort of a very coarse texture. The Green Hill Firebrick Co. of Northeast, show a set of stove linings. Quite a line of clay samples are shown in glass jars, but the absence of physical and chemical tests or burned products render them almost useless.

Ohio in its State exhibit also makes a very weak exhibit, considering the extensive development of this industry in the Buckeye State. The Crown Firebrick Company show quite a variety in quality, from low grade to very high brick. Some of their brick must have a very high heat resistence, judging from the excellent flint clay that is used in some of their brands, but absence of intelligent labels greatly weakens the small exhibit.

Kentucky, in its State exhibit in the Clay Industry display, makes a fine exhibit of its remarkably fine fireclay resources. Its manufacturers are well shown in complete attractive exhibits from the Louisville Firebrick Works, the Ashland Firebrick Works and the Tygart Firebrick Company. The first named company has a very complete line of shapes and a large range in quality that is especially noticeable for very refractory goods. Some magnificent samples of the very pure and highly resistant Carter. Co. flint fireclays are shown, which are remarkable for their purity, as the fluxing impurities only amount to two to three per cent. Many of the clay samples are accompanied by analysis and samples of the burned material.

Missouri's fireclay industry is magnificently presented by exhibits from almost every manufacturer in the State. They have entered into a most successful competition for honors, with the result of presenting the finest series of refractory goods ever exhibited at an international exposition. The completeness and wealth of the exhibits is certainly going to make a deep impression on the public respecting the great resources of Missouri and the highly successful means by which they are being utilized. The Missouri manufacturers have risen grandly to the occasion, and the future will unquestionably bear out the value of this judicious manner of exploiting their fine material. The plastic fireclays of Missouri are in the eastern portion of the State, where the factories are located, while in the central portion are the flint fireclay deposits that are shipped eastward to the factories. Most of the factories own mines in both districts, but some rely on the flint clay shippers, who market their clay in St. Louis and farther east. This flint clay is remarkably pure, having only 1½ per cent. to 2½ per cent. of fluxing impurities, and makes the most refractory goods to be found in the market. The St. Louis manufacturers are therefore able to produce any grade of firebrick up to the highest heat resisting brick known. The "Standard" St. Louis, which is made exclusively of plastic, non-selected St. Louis clay, makes a very strong, tough-bodied brick that has a high resistance to abrasive, but contains too much iron to withstand the highest furnace temperatures. There is a special run of plastic fireclay found in St. Louis known as "pot-clay" that is used for glass pots, which has practically no competition in this country, as Germany is its only rival in this specialty.

Among the exhibitors of the flint fireclay are the American Kaolin Co. of Warren county, and the Kelly Clay Company of Truesdale, who are exclusive miners.

EVENS & HOWARD FIRE BRICK COMPANY'S PAVILION.

The Evens & Howard Fire Brick Company's exhibit in the Palace of Manufactures at the World's Fair, which we illustrate on the opposite page, is notable not merely for the prominent position it occupies, but for the grateful result produced with just two very simple materials. fire brick and sewer pipe. The credit of this is due to the designer, Architect G. C. Mariner of St. Louis.

The principal material used in the exhibit is the Evens & Howard fire brick known as "Standard." We examined these bricks while the building was in course of erection and found them in beauty of appearance as well as in other respects, to be remarkably fine specimens of brick manufacture. The "Standard" bricks are used for iron, gas, glass, zinc, lead and other furnaces, for lining rotary kilns, or any purpose where a fire brick made from this kind of clay can be used and where not more than about 25,000 degrees of heat is employed.

Some of the fire bricks used in the construction are of the grade known as "Acme," for these titles "Acme" and "Standard" indicate grades. "Acme" is stated to be the highest grade of fire brick manufactured in the United States. It is made of a flint clay and is known in the trade as a flint-clay brick, it is used for temperatures of from 3,000 to 3,500 degrees.

The grades of fire brick manufactured by the Evens & Howard Fire Brick Company are "Acme," "3-Star," "Extra," "Standard No. 1," "Standard No. 2." The price of these bricks range from $15 to $30 per thousand according to grade.

The good-looking columns which have been produced with the company's ordinary sewer pipe are made of various sizes from 6 inches to 21 inches in diameter. It will be seen that the architect has ingeniously worked in various pieces of fire brick, fire-clay tile, etc., producing a really ornamental effect.

The floor is laid with the company's "Ironstone" paving brick. This is a very fine brick, though it is not an important part of the company's output. It is chiefly used for stable floors, private carriageways, etc., and is also used for high-class sidewalks.

The roof of the pavilion is also decidedly ornamental and, at a first glance, looks as if it is covered with a very effective system of roofing tile. A closer inspection shows that it is purely ornamental and is not designed to be weather-proof, as the covering consists of glazed conduits and gutter pipe.

In addition to the various kinds of products built in the exhibit pavilion, specimens are arranged inside. A piece of sewer pipe thirty-six inches in diameter, occupies the center. This is salt-glazed, double strength pipe and is the largest size made. Various specimens of fire brick and tile, made for zinc smelters, iron and steel works, cement and lime kilns, etc., are shown.

Entrance No. 2 to Clay Industry Exhibit, Terra Cotta Columns in Ivory Color by St. Louis Terra Cotta Co.

All the clay used in the manufacture of the different products is from the company's own mines, at Cheltenham, where the works are, and at places adjacent to St. Louis.

The extensive plant of the Evens & Howard Fire Brick Company, with its capacity of 100 tons per day, has long been one of the landmarks of that suburb of St. Louis known as Cheltenham, with Howard station on the railroad while the down-town offices and store at 915 to 922 Market street, are equally noticeable on account of the unique and artistic style of the building, which has previously been illustrated in The Clay-Worker.

Since the death of Mr. Laclede J. Howard the officers have been: President, C. D. Gregg; Vice President, A. Sproule; Secretary and Treasurer, G. W. Jones: Assistant Secretary F. E. Rhoads. At the present time Mr. Scott Horner is acting secretary in the absence of Mr. Jones, who has been away from the city for several weeks on account of ill health.

The manufacturers who are represented are the Fulton Firebrick Company of Fulton, the Vandalia Works at Vandalia, and at St. Louis the Evans & Howard, Mitchell, Laclede, Parker & Russell, Missouri, St. Louis Vitrified and Mississippi Glass Company, in fact every manufacturer in St. Louis is represented in the firebrick line, with only one exception. The St. Louis manufacturers all show very complete lines of shapes and different grades of brick, both hand and machine made. The gas retort business of this country is largely monopolized by St. Louis, and fine exhibits of retorts are made by the Laclede, Missouri and Parker & Russell Companies. The Laclede Company have a very impressive exhibit of their standard and their automatic self-discharging gas benches erected full size and at great expense in the Manufactures Building, while the Missouri Co. have erected a gas bench in the "Gulch" on Federal Ave. The Laclede Co. also have a working exhibit of their special coke-oven brick in the three bee-hive ovens being erected at the U. S. Fuel Testing plant, where the boilers will present a working exhibit of the Parker & Russell brick, and the dryer a working exhibit of the Evans & Howard brick. This latter company also have a very imposing pavilion made exclusively of their material in the manufactures building, a fine picture of which is shown on the preceding page.

The pot clay industry of St. Louis is confined to three producers, but is only represented at the Exposition by F. E. Bausch, who shows a full line of clays and glass-pots and zinc retorts made therefrom. The zinc smelters have found the St. Louis fireclay to be so favorably adapted to their severe demands that it is now shipped to every zinc smelter in the United States, as well as to every glass-pot maker.

One of the features of the clay industry exhibit is the firebrick kiln built one-third size that the Mitchell Firebrick Company exhibit on their space. It is shown in half section, and very clearly illustrates the flues and draught principles of the downdraft system. They are also making a working exhibit in the model foundry.

Illinois exhibits a few samples of a medium grade firebrick made by the Argillo Firebrick Company at Carbon Cliffs, Illinois.

Colorado exhibits a small line of the very successful goods made by the Denver Fireclay Company from Golden fireclays. This company deserves the success they have earned in making the finest line of asayers' crucibles, scorifiers and muffles produced in the world. For they experimented for years in attaining this result, and had failure after failure, in which goods shipped out had to be recalled and thrown over the dump. They now produce one of the finest, most reliable line of assayers' specialties that surpass the English, French and German goods that were formerly exclusively employed.

England presents the same brief line in her firebrick industry that she does in her other mineral resources, or a very limited line of fair type specimens. The famous Stourbridge and other Staffordshire clays are shown by ten hand samples, but with no physical or chemical analyses or finished products accompanying them, so that verv little information can be obtained from the insignificant collection.

Germany exhibits a good line of raw and burned clay and graphite crucibles from Gundloch & Co., at Grossalmerode, which district is famous for glass pot and crucible clay. A line of the raw glass pot and crucible clay from the Schippach works at Klingeneberg on Main is also shown. This is a black, very fine grained, highly plastic, tough fireclay which the analyses shows to be very pure.

Hungary exhibits a very interesting line of magnesite bricks and shapes, including raw and calcined magnesite. The shapes include blocks for the rotary kilns employed in the manufacture of Portland cement, where the temperature is not only very high but the corroding action is very severe. Other shapes are shown for electrical furnaces, as burned magnesite is even capable of withstanding the extremely high temperatures of the electrical furnace, which melts even the purest of fireclay bricks.

The Clay Industries' section contains many interesting displays of clay products, and many other displays of models of machinery, by which these products are made, and in one or two cases, full-sized machines are shown. For instance, the Williams' Pulverizer is shown, rather richly decorated for the occasion, but the real thing, just as it is working successfully in many plants throughout the country.

Near by it is the display of the Fernholtz Brick Machinery Company. Their space is enclosed with a handsome rich red brick wall, made of rock faced Alton pavers. They show two models of their presses and a large picture of an immense, handsome building, erected of brick, made on the Fernholtz press. The space is richly carpeted and offers the tired sightseer a comfortable place to rest for a little while.

A late addition to the Clay Industries' section is a line of fine art pottery from Ohio, displayed under the managemnet of Robert H. Sasse. Some very pretty and appropriate souvenir pieces are offered at moderate prices.

Across the aisle is the space occupied by the N. B. M. A., in which is shown a fine line of brick from the foreign countries, and beyond this is the display of THE CLAY-WORKER, the chief feature of which is a splendid chart showing the value of clay products of the United States compared with some mineral products, which was illustrated on page 703 of the June issue of THE CLAY-WORKER, and as was stated at that time, is a showing in which clayworkers may well take great pride. There are quite a number of other exhibits of model machines and specimen brick, of which we will give further particulars in another issue.

MOKILAND AT THE WORLD'S FAIR.

MAN IN A STATE of nature always appeals to man. But the aboriginal man, surrounded by all the peculiarities of his state when he and they are as by magic carried into the midst of civilization, form a combination that engages the thoughtful mind at all times. Such a feat of transformation was accomplished when the Cliff Dwellers three hundred in number, were brought to the World's Fair in St. Louis from their mysterious homes in the painted desert of the Colorado in Arizona, a country that a few years ago was as unknown to the average American as the interior of Labrador is to-day to the rest of North America.

Among these three hundred men, women and children are Zuni and Moki descendants of the Cliff Dwellers, who, from immemorial time, have occupied the caves and clefts in the inaccessible rocks and canyons of the unexplored West. For them there has been prepared at the World's Fair, a giant rock, a really stupendous artificial mass, into which they have carved their dwelling places in a way to remind them, amid strenuous modern surroundings, of the homes on the mesa and beyond whither they return when their metropolitan and expositional sojourn is ended. Here they pursue their daily routine, every moment of which tells the modern white man that, with the poet, "in even savage bosoms there are longings, yearnings, strivings for the good they comprehend not."

A part of the enclosure, called the Pueblo of Taos, also contains a museum of Zuni and Moki curios. Thev were not made yesterday, in fact, no scientific man would risk his fame in absolutely declaring when they had their origin. Pottery as old as the Pyramids of Egypt, mummies that were men when the Ptolemies reigned in the delta of the Nile, weapons that were swung two thousand years before the Savior trod the earth, are here exhibited. The lack of space forbids even a mention of the classes of objects here shown.

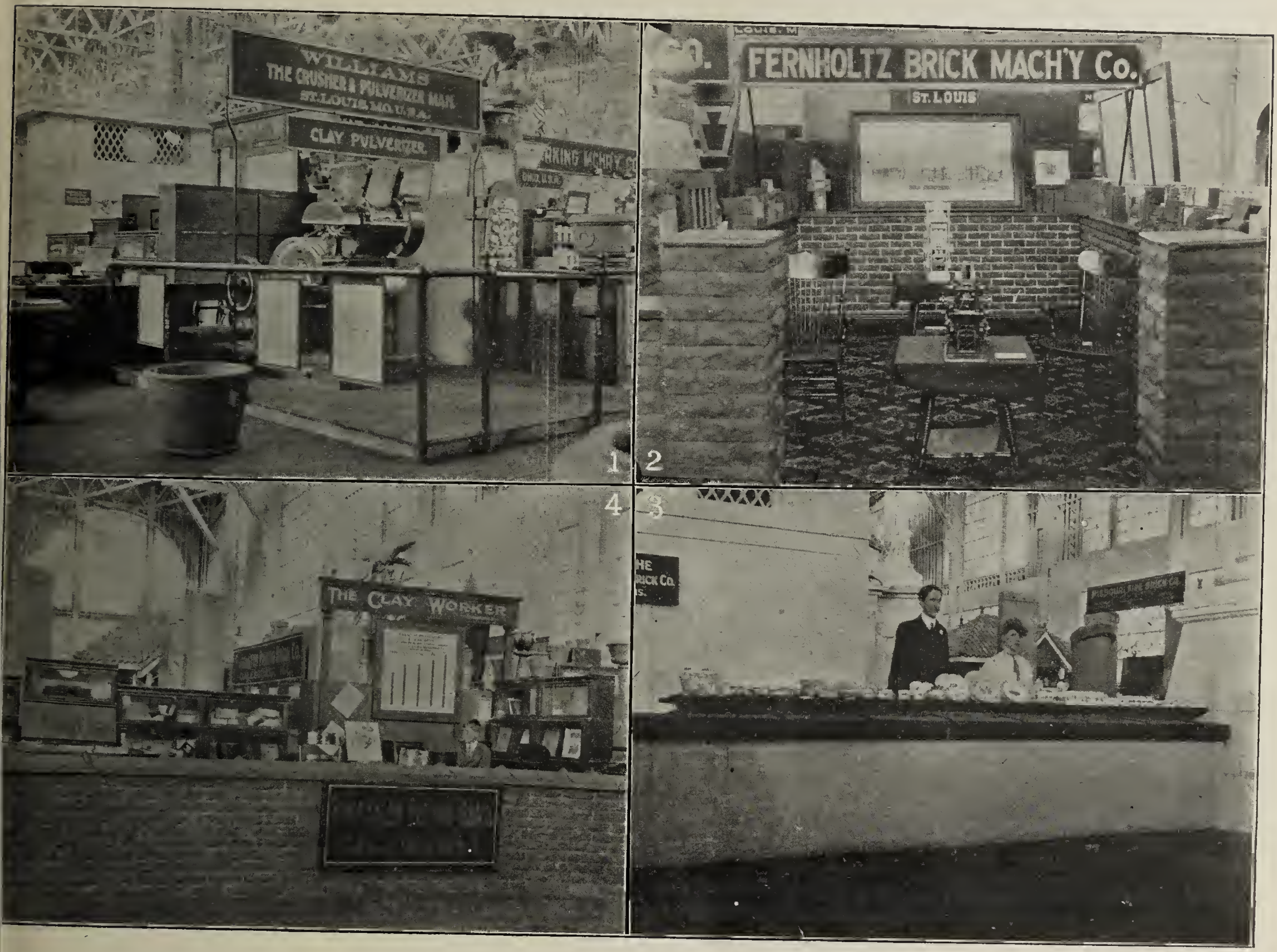
All these belong to the dim and hoary past. What is more germane is the daily manners and customs of these engaging descendants of a people which, in the days of their real greatness, must have been a greater people than the modern imagination can conjure up. These Mokis and Zunis conduct a theatrical performance, which for sustained interest, tells us white people of a later day that we have something to learn in the mysterious art of engaging public attention. Not to have seen the miracle-working snake dance of the Moki chiefs among the Cliff Dwellers at the World's Fair is to have foregone the most remarkable exhibition of native Indian skill and sorcery at this, the greatest of World's Fairs. Next to the wonders of the United States government exhibit, there is nothing at the Louisiana Purchase Exposition that compares in human interest with the showing made by the wonder-working Cliff Dwellers.

Written for The Clay-Worker.

AT THE WORLD'S FAIR.

Observations of a Clayworker on Points of Interest to Clayworkers.

THE ONE GREAT ADVANTAGE in the possession of riches lies in the owner's ability to bring the products of the soil and labor under his eye. By classification and study he is enabled to form a mind summary which is not only pleasing, but instructive. Fortunately, for the very rich, this process takes much time, and after the expenditure of this time and money, unfortunately, benefits come only on the most careful mind comparisons, which, in the absence of the real objects, are apt to be unsatisfactory.



A Group of Exhibits in the Department of Clay Industries, World's Fair. (1) The Williams Clay Crusher. (2) Fernholtz Brick Machinery. (3) R. L. Sasse and Mrs. Wesson, Exposition Ceramic Ware. (4) The Clay-Worker Display.

We do not often meet with clayworkers who have been able to spend the time required for the extensive travel which would ordinarily be required to study the product of the clayworking plants of the world or of the United States. This opportunity is, however, present or accessible to a great many, who may overlook the opportunity which may never come again to those now in the business.

The great World's Fair at St. Louis is a *World's Fair* indeed, and clayworkers have little to desire in it that is not present. It is true that there is no great display of working machinery on the grounds, that is, clayworking machinery, but within the reach of all visiting clayworkers, is a neighborhood more than remarkable in its diversified clay product and methods. Here are to be found plants producing all grades of ware, from the commonest to the most highly-finished and most elaborate in design. Here are successful clayworking plants, and for sake of comparison, those that are not as successful. It would be well to remark here that the stranger in this land should not start out on a visiting tour of the clay plants unless armed with the necessary passes. For some reason, not fully understood by some clayworkers, visitors are, in some of the plants, barred unless equipped with passes. There is no real reason why these should not be given, so it is safe to assume that they can be readily obtained.

There are many reasons why clayworkers should visit the St. Louis Fair. These reasons are all on the side of the visitor. There is no duty that he can consider owed to the fraternity, as no parties are in any way to be benefited but the visitor, unless it be the World's Fair management, who, by the way, are not clayworkers. A goodly number of clayworkers have already attended, and it is safe to say that if they have not been well pleased, that the counter attraction of the Pike is, in a large measure, responsible in alluring them away from the beauties of the clay exhibits.

There are reasons which can be advanced to argue against an attendance, but they are without force, except that visitors are careless and do not consider that many days can be spent in an effort to see things in which they are not interested. It is true that weeks could be spent in seeing things which are shown within the stores of some or many of our large cities. It is also true that the Fair contains some things, aye, many things, of much interest and value to any one, no matter what his occupation.

There is hardly a building which does not contain something of vital interest to the clayworker. We will endeavor next month to tell where all the somewhat hidden exhibits are located, and what they contain.

In the Palace of Mines and Metallurgy the clayworker finds the most interesting exhibit in his line, in a practical way, or, rather, in examples of products with which he is familiar. In the northeast corner or section of this building is now installed a work of great magnitude; great in conception and execution. This clay industries corner has been written up and illustrated in THE CLAY-WORKER, and there remains but little to say except reiteration. It is worthy, however, of remark from all who pass, and the writer cannot refrain from expressing his admiration, though it may seem unnecessary. Though large space would be necessary to express descriptive admiration, it can be well described as complete and beautiful. In this corner alone are thousands of reasons why you, Mr. Clayworker, should hasten to the Fair. Can you stay at home and imagine how it looks, do you think?

Palace of Electricity, World's Fair, Photographed at Night.

How do you come out usually, thinking of the size or beauty of a building or a scene that you have heard of but not seen; generally away ahead, don't you? Usually things you have heard a great deal about prove disappointing, don't they? Well, it will not be so with the World's Fair. It is a proposition, this World's Fair, which demands your presence, in order to gain your comprehension, and the clayworking display in the Mines building is all you are apt to think, and then some. After you are satisfied, you will then find things you haven't thought of or seen before. Here you will see the best that the ability of the best clayworkers can produce. This is all combined to the full artistic extent of the skilled artists of the trade. It is here that every form and color of clay ware is shown. Refractory wares in all shapes and sizes, architectural ware in the many beautiful shades, shapes and methods, and art ware in a liberal degree. Here are pressed brick, glazed and unglazed, ranging in color from white to the deepest shades in us; paving brick, enameled brick, terra cotta, sewer pipe, electric conduits, hollow building block and sandlime brick. These are worked up into the most attractive and elaborate designs, showing the many possibilities of the artistic use of clay wares. Here, in fact, can be found everything that is beautiful, remarkable, valuable and interesting, produced from clays. It is all blended and grouped so it can be quickly studied and taken in, and if you come before another outside entrance is made, you can study this great exhibit without interruption from those who have not heard of its beauty and have not been interested enough to dig it up. One of the unfortunate things, in the way of general advertising, is that this wonderful exhibit is tucked up in a corner with no outside entrance. The consequence is that many visit the building who do not realize that such a beautiful and interesting section is contained within its walls.

Perhaps by the time you come there will be a door, and the great numbers who now come down from the Government building and drift down the center aisle of the Mines building will find a more convenient entrance, which will take them through the best section in the building—the clayworkers' fairyland. Then this section will speedily grow to be much talked of and do much to emphasize the importance of the clayworking industry, particularly in America. Why should you be sure and visit the Fair, do you say? Well, why do you gain anything from inspiration—don't you think progress is due to inspiration and don't you want to progress? Sure thing! And of course you will come and—see the Pike.

How about conventions? You think they are great, and so they are, but you never begin to see the things there—you hear about them. Here there is no such thing as bluff—the goods are on hand. This might be made a great convention of clayworkers, in continuous performance, if they would all come.

If you are not acquainted, at the very entrance you will find the medium of acquaintance and spread of knowledge—THE CLAY-WORKER. Their exhibit is here, and on giving your name to its representative, who is on hand at all times, you will be introduced into Fairyland and given a start on an interesting trip and a good time. Anything else, you say? Yes, tons of it. State exhibits, which do not go as extensively into display, but contain examples of products and the raw material from which they were made. You will find on every hand something beautiful in clay. We will endeavor to cover the ground quite thoroughly, and feel that if we could do the subject justice in a few words, none would be so poor in feeling as to be able to resist the call for attendance on this great Fair, the Fair of the clayworker truly, as well as the Fair of the weaver, the miner, the farmer and the mechanic.

O. B. SERVER.

Written for THE CLAY-WORKER.

ST. LOUIS BRICK AND BUILDING NEWS.

THERE CONTINUES to be a gradual increase in the amount of building that is being done in St. Louis. This is shown in the report of the building commisisoner for June.

Business conditions are gradually improving and indications point to a continuance. Most of the construction work now going on is small buildings and they are going up in the western part of the city. Some large business buildings, however, are also being put up. By fall a great many of both large and small structures will be under way it is thought.

Our brickmakers are fairly busy, although not as busy as they should be. Permits for building work estimated to cost $1,190,549, were issued last month by the building commissioner. In June, 1903, there were issued permits for buildings estimated to cost $747,666. For new brick buildings 127 permits were issued last month for work estimated to cost $912,670, as against 88 permits a year ago for buildings to cost $518,878. There were 217 permits for frame buildings, estimated to cost $69,780, as against 140 permits in June, 1903, for buildings to cost $46,708.

Interesting World's Fair Sculpture.

The Instructor.

The Miner's Home Coming.

Pleasing Allegorical Groups.

Manual Training.

The output of the new plant of the Banner Clay Works at Edwardsville, Ill., is increasing at the rate of several thousand a day, and additional machinery is brought into play. Two of the eight kilns are done and the 123-foot stack was completed a few days ago. Bricks are now being turned out for the remainder of the kilns, 1,000,000 being required for this work. The first contract the new company received was for the 1,000,000 vitrified paving brick for the city of Edwardsville.

The Versailles, Mo., Fire Brick and Clay Manufacturing Company filed a statement a few days ago, to show that it had made an increase in its capital stock from $60,000 to $75,000, the assets are given as $80,000 and there are no liabilities.

The Van Briggle Pottery Company, who have an exhibit in the Palace of Mines and Metallurgy Building at the World's Fair, illustrates very clearly the wonderful advance which has been made in the art of ceramics in the last few years.

At this exhibit, the six stages, from the new clay to the finished product, is set forth.

The Van Briggle factory, located at Colorado Springs, is the leading exponent of the old Chinese glaze pottery which is considered by many as the highest stage of the ceramic art.

Mr. Artus Van Briggle, the inventor of this style of pottery, spent many years in the perfecting of his art, although constantly struggling against ill-health and finally, just as his work was beginning to be appreciated by the public, died at his home in Colorado, July 4, 1904.

The Chinese mat glaze was considered a lost art until rediscovered by Mr. Van Briggle and improved in his factory in Colorado Springs.

A. SAINT.

Written for The Clay-Worker.

GATES' TERRA COTTA PICNIC.

Queer Doings at the Home of the King of Buttonholers—Oranges and Figs Plucked from Maple Trees.

INDEPENDENCE Day, 1904, will long be remembered by members of the Chicago Architectural Sketch Club as the day Gates celebrated.

To readers of The Clay-Worker it is unnecessary to specify by initials or otherwise what Gates it was that did it. The large, red-lettered bulletin issued by the Architectural Club announced that "Mr. W. D. Gates, of Teco fame, extended," etc., but that was because they felt that the least grateful politeness they could show their gracious host, was to let him see his name in large print. At all events Gates took occasion to celebrate in his peculiarly selfish way by inviting the members and ladies of the Chicago Architectural Club and some of his friends in the trade to a characteristic "doings" at his home in Terra Cotta, Illinois. In some ways it was a "sane Fourth of July" that he planned—no firecrackers and no booze—but what his guests had to look forward to can best be told by the following program, issued in the form of a bulletin by the Architectural Club:

GRAND ATHLETIC TOURNAMENT AND FIELD DAY, JULY 4, 1904, AT TERRA COTTA, ILL.

Mr. Wm. D. Gates, of Teco fame, extends an invitation to the members and ladies of the Chicago Architectural Club to be his guests on July 4th, at Terra Cotta, Ill.

"Ain't This a Hot Stunt?"

In order that the club members may have no excuse for staying away, the Chicago Architectural Club hereby declares the Fourth of July a legal holiday, and forbids work of any kind, except as herein provided.

A special coach has been reserved for the club members and ladies. Nothing is required of the members except to appear at the Northwestern Depot on Wells street, on Monday morning, July 4th, at 8:30 a.m., with *sketching materials*, and Mr. Gates will do the rest.

Eatables, drinkables and smokables will be served under the spreading chestnut trees, so don't bring any cold hand-outs.

Program of Events.

1. Arrival at Terra Cotta. Address of welcome by the chief of police. Walking contest—open to all. Raid on the lunch.
2. Exhibition of aerial trapeze contortions by Fritz Wagner.
   Bricklaying contest for the Terra Cotta championship, by Herman L. Matz and Roger Combs.
   Exhibition of fancy golf, by William K. Fellows, champion of the Marquette building.
3. A series of athletic competitions, ranging from pole vaulting to tiddle de winks.
4. Sketch competition in oil, water color or pencil.

A beautiful, guaranteed prize will be awarded to each victor, and each competitor will receive, free, a fine engraved trading stamp, all ready for framing.

(Signed) Hugo H. Zimmerman,
Chairman House Committee.

The program went off, according to those who were there, very much as planned, only more so. Seventy people went out on the special car provided by Mr. Gates. Fritz Wagner, touted as "a ground and lofty tumbler" in the bill, was, unfortunately, not among those present. The lamentations on that account, however, hardly got well started before William B. Mundie gallantly and nimbly leaped into the breach, and all went merrily. Harkening to the exhortation to bring sketching materials, Mr. Mundie thoughtfully provided himself with an apron and sunbonnet and began at once. He did several sketches on the way out—most of them comic, and they say he had Primrose and Dockstader, Weber and Fields (late dissolved) and all the rest of them skinned a mile. The same dinky costume served for a baseball suit later, and produced a profound impression.

The train pulled out of the Wells-street station at 8:45, and the special car was laid off at Terra Cotta shortly after 10 o'clock. The walking contest proved to be a necessity, as it was found impossible to have the car switched up to the grounds on the holiday. After a walk of half a mile the merrymakers were met formally and officially by the host of the occasion, Gates himself, who, disguised as the chief of police of Terra Cotta, delivered a brief address of welcome. This done, he proceeded with Prosser to show them the wonders of the place.

The way the fruit on the trees had been forced was amazing. Even as a plain proposition of "grafting" it looked as though it had taken a lot of wire pulling, or rather wire stringing, to make the trees appear as they did. In fact, Edward Kirk, secretary of the Builders' Club, who was unanimously chosen to keep a record of the day's events, said that Gates, with his usual blarney, had just gone out to interview the trees and had "strung" them along until the maples bore oranges and the Oak trees figs. In order that the city folk, unused to such phenomena, might not be deceived by the natural foliage of the trees and look with suspicion upon the fruit, large signs bearing the legends, "Orange Tree," and "Fig Tree," appeared on the boles. An enormous Teco urn filled to the brim with lemonade flowing over a cake of ice, bore the inscription, "Under the Bamboo Tree."

The raid upon the lunch came at 1 o'clock, miniature Teco vases being the souvenirs of the day. Then followed a baseball game in which Architect Mundie starred at first base. The game was called a tie after three innings had been played in order to leave daylight for the other sports. The bricklaying contest, like the aerial trapeze performance, went by the board, but there were running, jumping and throwing contests, with prizes of pipes and doll-babies and nursing bottles for the victorious victims.

In the general mix-up all records of the events were broken so badly that even the fragments were lost, the only triumph recalled by Score-keeper Kirk being that of Mundie in the shot put, and the way his apron fluttered and kicked up a breeze that wafted the shot out inches beyond the marks of his closest competitors, made that hard to forget. The art competition in "oil, water-color or pencil," developed into a struggle to see who could pin the tail onto the donkey.

A concert at the Gates house concluded the program and the happy crowd returned to the city about 9 o'clock in the evening, remarking that Gates had outdone even himself. Script.

CLAY TRANSPORTED ELECTRICALLY IN BRICK PLANTS.

MR. F. E. WOODFORD, chief engineer for The Aregood Construction Company, has originated a mode of electric transmission for conveying clay from the pit to the plant without the use of a small locomotive or men to operate it. Its operation is almost by itself as most of modern electrical equipments have been developed.

While there is nothing new in powering small cars electrically, for carrying freight and other material, the feature of this system is its control, which is accomplished at each end of the line. Current is delivered to the track through the third rail system at a lower voltage, thus avoiding all danger to any one working around the track. The operator has control of the track instead of controlling the cars. At the loading or shovel end the cars are started and after they pass the switch to the main track they make a continuous run to the foot of the incline, where they are brought to a standstill, and upon this short stretch of track are under control of the operator, who has charge of the dumping of the cars at the plant. As a car is needed it is brought forward by the operator until the foot of the incline is reached, where it is caught by an endless chain and hauled up the incline. As it reaches the top it passes to the level stretch of track extending into the building, where it is again under electric control of the operator and may be brought forward, stopped, and started back at will. The dog engaging the endless chain is lifted at this end, and the empty car passes down the incline over the same track up which it was hauled. It is controlled in the downward passage by an electric brake manipulated by the operator, thus preventing its too rapid descent. The car here passes to the return track, then making a continuous trip to the shovel end, where its control is managed by the operator of the shovel, in much the same manner as it is controlled at the plant. It can be run either way on this piece of track, and is continuously held by the brake until released by the operator. The dog is turned down before it is started back to be in readiness to engage the chain on the incline, and after the car passes to the main track its trip to the foot of the incline is again continuous.

It will be seen that long distances between plant and shovel are of no consequence to this system, and clay may be taken from a pit entirely separate from and at considerable distance from the plant. It will also do the work with from three to eight men less than with ordinary methods, depending upon the size of the plant.

The expense of the third rail is light as a very small rail is used, and the track is easily portable, and as easily extended as one of two rails and ordinary construction. The motors are of the ironclad type so that their operation is a certainty in any kind of weather, and they are speeded to run the cars at the rate of five miles an hour. A small generator is installed and driven from some convenient shaft at the plant and supplies the power required for the system.

The Aregood Construction Company are inaugurating this system, and where it is desired are making it a part of their improved methods in the construction of modern clayworking plants. Its cost is replaced in a short time by the saving of labor in the clay pit, and its easy operation makes it a most desirable feature to the industry.

THE JUNIOR MEMBER OF THE SCOTT NOISELESS PLANT FAMILY.

THE SCOTT Noiseless Plant has four members: The Andrus Press, the Scott Clay Pulverizer, the Scott Clay Mixer and the Scott Elevator.

The Andrus Press is generally known as the senior member of this family and we wish to name the Scott Clay Pulverizer as the junior member. This is the heaviest clay pulverizer in the field, the Scott idea being carried out throughout, in that it is very simple and represents all that is required in a clay pulverizer.

The Scott Clay Pulverizer.

Wm. F. Scott, the president of this company, has been building pulverizers for a number of years and he contends that the pulverizer which will last the longest and give the most efficient service is that one which is built the heaviest and that has as few working parts as possible; he therefore builds the 42-inch clay pulverizer only, an illustration of which is given above.

They claim for this machine that it will save the brickmaker 50 per cent. of the power and 50 per cent. of the expense of maintaining same over that of a dry pan. Its rated capacity is from 15,000 to 20,000 a day in hard shale and 20,000 to 25,000 in soft shale and surface clay. The company claims that it has made quite a number of recent sales which have been very satisfactory and they are only too glad to correspond with all interested brickmakers, giving them the benefit of their experience.

Written for THE CLAY-WORKER.

THE OUTLOOK—NO. 3.

The Law of Supply and Demand.

THE VALUE OF real estate depended upon the great law of supply and demand. One of the greatest mistakes any financier can make is to underrate the value of homes and farms and the influence any great change in the prices of them naturally has upon all business within a nation. They form the basis of our wealth, and whatever seriously affects them, eventually reaches the uttermost parts of the earth. Cheap lands and cheap homes mean more to a nation than cheap manufactured products. But cheap homes, measured by prices that obtained only ten years ago, are things of the past. There can be no return. Good land can never again be had for ten dollars per acre.

Farms are being divided and subdivided to make room for new farmers, until many, becoming discouraged at their small holdings, sell out and crowd into our cities and towns, thus making increased demand for city real estate.

It is hard to overestimate this change now going on. It is no new thing, but its magnitude is so much greater than formerly that it assumes the aspect of an entirely new factor in our political economy.

In former times, the farmer who was crowded out of his native lodgings simply moved a few miles west, built himself a new log hut or sod shanty, and commenced anew the life of a pioneer.

But there is now no more west to go to. Say what you please of the millions of acres still owned by Uncle Sam, which he is willing to bestow upon the honest homesteader, the fact remains that we have about finished up this Westward ho! business. It is uphill work now to build a home upon anything our nation has to give away. The tide of humanity is like water—it flows into the channels of least resistance. It will not flow up hill until every avenue for downward flow is stopped, and it is forced to take the difficult route.

The great American desert may some day be conquered and furnish homes for millions where now only grow the cactus and sage, but we need not seriously consider that problem in the year 1904. The immigration for the next few years is going to be from the farm to the city. Each village, town and city will receive its quota in proportion as it opens up avenues for this vast stream of moving humanity. All this means new homes in cities and towns, and a great demand for our building materials. It would be a surprise to any one who never was brought in contact with the two classes of trade to know how much greater proportion of bricks enter into the construction of town homes than in country homes. Even a small town of 3,000 people furnishes a greater demand for the products of our factory—excluding drain tile—than the country trade of five times that population. The long-looked-for decline in the price of land has not yet reached us, although we hear rumors of financial depression and prophecies that the time is near at hand. Still the people are crowding and jostling one another in the attempt to get more room, and holders of surplus real estate see the point and keep a tight grip upon their possessions, and though prices now seem high to us, yet we believe that though temporary slumps in values may occur, within a few years present prices will seem as low to us as does the prices that prevailed ten years ago.

These high prices of farm lands have caused another change to the brickmaker's advantage besides the new city homes made necessary by change of residence. When land was $25.00 per acre, only rude improvements were put upon it, and no attempt was made to drain it. But now that an acre costs from double to thrice that price, it must be made to do the best possible for it to do, and that is calling for millions of drain tile. Farmers are invading the swamps and bayous, constructing levees and drainage systems that were impracticable prior to the great advance in land prices.

It is the same old story of humanity making the best of existing circumstances—some going to the cities, and others going to the waste places, but all using our products to accomplish their purposes.

Fifteen years ago a friend of mine became a bankrupt from a failure in the mercantile business. He was past the age when men usually recover from such disasters, and found it impossible to obtain work in his line of business. All that he had left was a large tract of cheap land, mortgaged for every dollar that could be borrowed upon it. The mortgage was held by a friend who could afford to be lenient to the old man, and who permitted the interest to run over whenever the debtor could not pay. The hardest times we ever experienced came upon us, but the old man held to his land. The long lane came to a turn at last. There was no discovery of mines or oil wells upon his land, but this steady demand for new homes made his cheap land valuable, and the old man lived to pay every debt and still have means in abundance.

What does this story have to do with the brick business? We have within the last five years sold thousands of dollars' worth of bricks and tiles for the improvement of this land which fifteen years ago would not have sold for one-half enough to pay for the bricks and tiles upon it now, and still the end is not in sight. It will take many more bricks and tiles to put it in condition to satisfy the ideas of the present owners. It is this close connection we have with the needs of an ever-increasing population that gives us such unbounded confidence in the future of our business. We believe there are few lines of manufacture that are so sure of steady demand—though even the brickmaker knows from past experience that rocky times have come to all of us, and are likely to return. But just as surely will there be a return to the good times that have gladdened our hearts for two seasons at least. In our next article we wish to take up the labor question and give some of our experiences and impressions, and the conclusions we have reached after having been worked by the workers and struck by the strikers. L. C. Moore.

News from Ontario.

Editor Clay-Worker.

The writer has just returned from a visit to our northern friends in Toronto and find them all very busy filling large orders for soft-mud building brick. There are a large number of houses being built in Toronto at this time, owing to the fact the demand there far exceeds the supply; consequently rents and values are pretty well up in the air.

I took a walk through the burned district of Toronto, which covers about six acres, with Mr. A. J. Stevens, C. E., who is a member of the Can. Soc. C. E., and find there is not really much to learn, as there were no fireproof buildings, all of them being wood construction and brick. In fact, in the writer's estimation, the fire was rather commonplace excepting for its size. There has been some buildings started there, but owing to a scarcity of labor and labor troubles in the building parts, very little will be done until later. However, all of the concerns have secured temporary locations and are going ahead with their business with increased and renewed energy.

The Ontario Paving Brick Company, who are operating a Raymond No. 1 brick Machine and an old style A2 Automatic Cutter, are turning out about 35,000 first-class paving brick every day and have a market for every one they can make.

The Simpson Brick Company, who recently had a small fire, which destroyed their power plant and drier, have sold out to Mr. Russell. They will put in temporary power and dry their brick in racks, so as to be able to get out orders which they now have booked. Chas. W. Raymond, Jr.

Pittsburg, Pa.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Wants a Remedy for Cracked Brick.

Editor Clay-Worker.

I have just put in a stiff mud brick plant here, and I am using a soft red shale, which checks and cracks in drying, especially in the sun and wind. I would like to have some one give me a remedy for this trouble. G. E. Zimmerman.

Chickasha, Ind. Ter.

Good Report from Iowa.

Editor The Clay-Worker:

Business has been splendid since April, 1903; could not supply the demand. My plant is small, compared with some, but have turned out fifteen twenty-four-foot kilns since we started, and loaded them hot. The demand is still good and looks as though Roosevelt will keep us prospering for another four years. Farmers have found it poor policy to stop laying tile because there comes a little dry spell. Building prospects are good in our locality. Am awful busy to think of reading much, but don't stop sending The Clay-Worner until I quit the business. Wishing you the success you deserve,

George H. Kettell.

A Busy Louisiana Brick Plant.

Editor Clay-Worker:

Enclosed please find check for my subscription to The Clay-Worker.

The Clay-Worker has been very helpful to us, and can say it is well worth the money to any one who is interested in brickmaking. We are doing a good business, have made near two million brick since we have been in operation (since March 1st). We are using a Sword machine, has the capacity of about 30,000 per day. Our clay is about one or one and one-half feet from the top of the surface, and under the surface clay is brown shale which makes a good, tough red brick that generally meets the approval of the architects. The demand is good for brick, and the probabilities are that we won't be able to supply the demand.

Very respectfully,
Ruston Brick Works,
Ruston, La. Per Green.

Another Specialist—The Brickyard Carpenter.

Editor Clay-Worker:

Your valuable paper reached me in due time, and find it fully up to my expectations. Enclosed you will find express money order for two dollars for one year's subscription. You ask about my interest to brickmaking. It is this: I am doing special work in the line of carpentry, such as building new elevators and spouting, also mud conveyors. Put one in about 75 feet long for the Canton division of the Metropolitan Company this last winter, and a year ago the same thing for the Royal plant, and it has given good satisfaction. I will not go into details, but suffice to say I have worked for the Royal and Imperial since 1897, till the heat proved too much for me in the kilns, setting brick for four years. Then, being good at carpentry work, I got inside work in the winter and outside in the summer. I concluded The Clay-Worker could help me in more ways than one, and I might be the means of helping some one else, knowing that we all work together.

Canton, Ohio, June 20, 1904. A. A. EVERHART.

CLAY NEWS FROM THE "BLUE GRASS" METROPOLIS.

THE BRICK business in the vicinity of Louisville is moving along quite satisfactorily, and no one has anything to complain of. Everybody seems to have all they can do.

The Kentucky Vitrified Brick Company has a big paving contract at Paducah, Ky., which, together with their other calls for vitrified paving brick is keeping them very busy and will insure them plenty of work for the balance of this year. This company was unfortunate enough to lose its plant by fire recently, but they were fortunate enough to have quite a stock of material on hand, which helped to tide them over during the rebuilding of the plant. They have just now got their plant in operation again, and everything is moving in good shape once more. This company also has, in addition to the paving contract at Paducah, Ky., a contract to furnish fireproofing for the city jail here in Louisville, and also fireproofing for the court house at Paris, Ky.

The Louisville Brick Company is furnishing brick for the new Monon depot being erected at Fourteenth and Main streets, and with this and other orders coming in has plenty of business in sight to keep them going all summer.

The P. Bannon Sewer Pipe Company reports a good demand for sewer pipe and other products along this line, and say they have about all they can do this season. In fact, it is proving a very good year for them, and they have nothing to complain of.

The John Bauer Pottery Works, No. 2122 Preston street, report that in the early part of the summer business was rather dull, but they are very busy right now on open jars for fruits, etc. The demand for this class of goods promises to be excellent this year, fcr there is a very good fruit crop in this section. The jug trade gets active along about September. At least, that is the season when the big demand for liquor jugs comes in, and they anticipate a very good trade in them this fall. They are selling some right along, and one of the features of the jug market this season is that there seems to be more jugs with bails than heretofore. Whether we are to have a run on this class of jugs now or not, it is too early to foretell, but from the number of them appearing in the show windows, it begins to look like the jug with the bail will be a favorite this year. The John Bauer Pottery Works make these jugs with bails, in various sizes, including one quart, half gallon, one and two gallons. On inquiry as to where they secure the bails for this work, it was learned that they purchase the wire and make the bails themselves, but buy the turned handles from Baker & McMillan, of Akron, Ohio. Another firm that makes a specialty of furnishing these turned bail handles is the Wood Enameling Company, of Kokomo, Ind. THE COLONEL.

PHILADELPHIA AND BALTIMORE BUILDING NEWS.

SEEKING SHADE and information, I dropped into William Galloway's Terra Cotta Works. Since the last disastrous fire Mr. Galloway has done much to improve the works and his exhibits. "Business," he said, "is good. We have an exhibit of potery, garden statuary and terra cotta in the St. Louis Exposition, located in the Horticultural building. This measures 60x15 feet, and embraces a little of everything that we manufacture."

Within the plant he is also working out the terra cotta detail that goes to ornament the new building to be erected for Henry White, in place of the one destroyed in the late fire at Baltimore. This will be erected at 17 and 19 Baltimore streets. He has also the contract for the terra cotta detail to be used in conjunction with brick on the new warehouse, to be erected in that city for the Johns Hopkins University trustees.

Also for this city he will supply all of the terra cotta for the Ebenezer Methodist Church, at Fifty-second and Parrish streets, also the Weiner building, to be erected at Thirteenth and Arch streets.

—At Baltimore.—

As I stepped off the boat at Light-street wharf, I was for the time nonplussed as to which way to turn. There lies before one acres and acres of demolished brickwork, here and there a rough and jagged wall, and up towards Charles and Baltimore streets, the gaunt skyscrapers of the Equitable and Atlantic buildings, the sixteen-story Continental Trust, and the Union Trust Company's building, all stand with vacant interiors, looking like so many blind men gazing with sightless orbs upon the ruins below. A stranger might well ask, "Has nothing been done?" and the native might reply, "You see nothing's been done." Beyond a little clearance here and there, the demolition of a standing or dangerous wall, it would seem that little progress has been made. Some half-dozen small buildings have been erected. But right down on the ground level remain the bricks, unclean and chaotic. Here and there some pretense of stacking has been made, but you may wander through the streets of the burned district, through byways through which you were wont to be familiar, and realize now that you are an utter stranger. Speaking to an insurance man, he berated them, the Baltimoreans, for their seeming tardiness. He said: "There is no excuse; with one single exception the losses have been adjusted. But these people are slow, and you may believe me or not, but it will take them ten years to straighten this thing out."

Knowing something of architecture, I asked him did he realize the difficulty of loading and transporting 600,000,000 brick; could he suggest a method by which the Equitable building, the Union Trust and the Continental could be rebuilt, and wherein could you stack 600,000,000 brick? Truly, it is a problem. Seemingly it would be a hazardous job to take down that sixteen-story skyscraper, and yet so bent and warped are the steel lintels, so spalled are the sills, capitals, string courses and cornices, that upon analysis it would seem there was nothing left but a thin shell of the outer walls, and I scarce know who would readily undertake the task, for it would seem practically worse than to undertake to turn an old coat into a new one. No, Baltimore has a huge problem before it, and one that will take many days and many hands to solve.

Brick men, too, are grumbling, since the brick prices have not advanced any over the quotations of last year. In fact, Alfred D. Klein, of the Champion Brick Company, says: "Brick are netting the manufacturer 5 per cent. less than a year ago, although prices have not advanced to the general public." There is nothing in the price of brick to cause any hesitation in building.

The Baltimore Brick Company is now located at No. 7 Clay street, and prices rule as last year.

Friend Classen, of the Maryland Lime and Cement Company, is now located at 216-218 South street.

The general tendency of the building supply men is to marvel at the inability of prospective builders to seize the present opportunity to build. Cement is 40 per cent. cheaper than it was last year, sand 20 cents a load less, terra cotta 25 per cent. cheaper, millwork 10 to 25 per cent., and, as the insurance man said, "the people are too slow to take a hold."

The straight truth is, contractors and supply men, expecting a big rush after the fire, stocked up heavily. This caused close competition, and the inertness of things generally, with labor plentiful, has caused the bottom to fall out.

Granny's advice is, "Never put the kettle on till you want yer tea." W. P. L.

Mr. Batley with Chambers Bros. Co.

The Chambers Bros. of Philadelphia, Pa., well known manufacturers of machinery for stiff tempered process brick making has secured the services in its sales department of Mr. Alexander R. Batley as its representative for Kansas, Indian and Oklahoma Territories, and Western Missouri.

Mr. Batley's long experience in this line of work, and his ability as a practical manufacturer of clay goods, eminently fits him to serve the trade well. Backed by the excellent machinery turned out by the Chambers Bros. Co. his new connection should prove advantageous to all concerned.

His postal address is P. O. box No. 172, Pittsburg, Kansas. His assistant there will give immediate response to all communications in Mr. Batley's absence wiring him when necessary to meet customer's requirements.

THE BEHAVIOR OF IRON, IN CLAY, WHEN BURNED TO VISCOSITY.

[A Thesis Presented at Cornell University by Geo. C. Matson as partial requirement for a minor in economic geology for the degree A. M.]

Definition of Clay.

CLAY IS DEFINED by Dr. G. P. Merrill[1] as "an indefinite mixture of more or less hydrated, aluminous silicates, free silica, iron oxide, carbonate of lime, and various silicate minerals which in a more or less decomposed and fragmental condition have survived the destructive agencies to which they have been subjected."

This is, without doubt, the best definition which could be given from the standpoint of a mineralogist; and it shows very clearly that the term clay has no definite chemical significance. From the standpoint of the clay-worker, some definition is needed which will include the properties possessed by all clays.

Prof. H. Ries thus sums up the physical properties of clays in his bulletin on the clays of Maryland,[2] he says: "The only properties which they all show is that they are plastic when wet and they become hard as rock when burned." The term clay in this paper, will be used in accordance with the second definition.

Stages in Burning Clay.

In burning clay, three stages can be recognized: (1) Incipient fusion, (2) vitrification, (3) viscosity. When burned, clay becomes nearly impervious, incipient fusion has begun; when it becomes hard and compact throughout, the clay is vitrified; and when the clay begins to flow it is said to be viscous. In the experiments performed by the writer, the clays were invariably found to contain many gas cavities, when burned to viscosity. These three stages are not sharply defined and occur at very different temperatures in different clays. Moreover the amount of increase in temperature necessary to pass from one stage to the next, as for example—from vitrification to viscosity, may vary greatly in different clays.[3]

TABLE OF ANALYSIS.

1 Clay.*	2 Condition.	3 Color and Texture.	4 Temp. Cone—F. C.	5 % Total Iron.	6 % Ferrous Iron.	7 % Ferric Iron.	8 % Total Iron Still in Ferrous Condition.
Smith Landing, N. Y.	Raw . .	. . . .	. . . . . .	7.367	2.550	4.817	34.6
Smith Landing, N. Y.	Burned. .	Melted to red, vesicular mass. . .	8–2354–1290	10.490	1.263	9.711	12.18
Smith Landing, N. Y.	Burned. .	Red porous. . . .	3–2174–1190	10.364	1.779	9.101	16.9
Newfield, N. Y. . . .	Raw . .	. . . .	. . . . . .	4.905	2.697	2.308	54.9
Newfield, N. Y. . . .	Burned. .	Melted to yellow, vesicular mass . .	8–2354–1290	6.540	1.190	4.350	18.1
Newfield, N. Y. . . .	Burned. .	Yellow porous . .	3–2174–1190	6.020	1.799	4.221	28.8
Newfield, N. J. . . .	Raw . .	. . . .	. . . . . .	8.371	2.398	6.973	29.0
Newfield, N. J. . . .	Burned. .	Red, slightly porous.	3–2174–1190	10.464	1.245	9.219	11.9
Newfield, N. J. . . .	Burned. .	Red, very porous .	5–2246–1230	13.080	1.090	11.990	8.3
Amenia, N. Y. . . .	Raw . .	. . . .	. . . . . .	3.139	. . .	3.139	. . .
Amenia, N. Y. . . .	Burned. .	Red, slightly porous.	5–2246–1230	4.185	. . .	4.185	. . .
Magnetite & Feldspar	Raw . .	. . . .	. . . . . .	34.404	12.271	22.133	35.6
Magnetite & Feldspar	Burned. .	Black, very porous.	10–2426–1340	46.676	1.640	45.035	3.5

*In column 1, the name refers to the locality from which the clay was obtained. In column 4, the temperature, Seger's cones were used. The F. and C. equivalents are from the report on the clays of Michigan, by H. Ries.

In columns 5, 6 and 7, the per cent. is based upon the total weight of the clay; in column 8 the per cent. is based upon the total iron.

Form of Iron in Clays.

Iron occurs in clays chiefly in the form of oxides, limonite and hematite, in the carbonate, siderite, and in the sulphide pyrite. In addition to the above clays may contain magnetite, ilmenite, marcasite, melanterite or some of the silicate minerals, such as garnet, hornblende, and mica, which contain iron.

Condition of Iron in Clays.

Both ferrous and ferric iron occur in clays, the percentage of the former usually being low, while that of the latter may run as high as 10-15 per cent or more.

If the clay be heated in an ozidizing flame the ferrous iron will naturally be oxidized to ferric iron; however, it has been held by some, that if the clay be heated to a sufficiently high temperature the iron would again return to the ferrous condition.

Rudolph Von Wagner expresses the opinion that iron returns to the ferrous condition at high temperatures.[4] "Whilst pure clay burns white, it is turned red by ferric oxide, the darker, as the heat applied is stronger. If the heat is still raised, the color becomes greenish, and finally black, according to Remole, by the partial formation of ferrous oxide."

Seger says of ferrous compounds in burned clays[5] "Outside of ferric oxide there comes into consideration also, iron compounds, lower in oxygen in regard to the coloration of clays; this lower oxide is formed, during the burning, from the higher, in presence of carbonaceous substances in the clay, or under the influence of fire gases at very high temperatures. It may also have been originally present in the clay.[6] "Seger also speaks of the iron in burned clay having three degrees of oxidation, ferric oxide, 28 parts of iron to 12 parts of oxygen; ferrous oxide, 28 parts of iron to 8 parts of oxygen; and ferrous-ferric oxide, 28 parts of iron to 10 parts of oxygen.

Seger attributes the yellow and red colors of burned clay to ferric oxide, the blue and green colors he considers to be due to ferrous oxide; while the ferrous-ferric compounds give colors intermediate between those of the ferrous and the ferric compounds.

From the above statements it appears that Seger believed that iron returned to the ferrous condition, either wholly or in part, when burned at high temperatures. Wagner's statements practically agree with Seger on this point. Prof. Ries accepted their opinions.[7] "While it may be said that the burning of clay in an oxidizing fire converts the iron to the ferric condition, still this statement holds true up to a certain temperature, depending on the fusibility of the clay, for in every clay the iron seems to return to the ferrous condition as the point of vitrification is approached. The change would of course be accompanied by the liberation of oxygen, which would increase the amount of iron in the clay and may account for the greater blistering of ferruginous clays as the point of vitrification is passed and that of viscosity approached."

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[1] Rocks, rock weathering and soils.

[2] Report on clays of Maryland, Md. Geol. Survey, Vol. 4, p. 205.

[3] For further discussion of this question, see Bulletin No. 35, N. Y. State Museum, p. 552.

[4] Manual of Chemical Technology, p. 634.

[5] The collected writings of Herman A. Seger, translated by the members of the American Ceramic Society, Vol. I, p. 108.

[6] The collected writings of Herman A. Seger, translated by the members of the American Ceramic Society, Vol. I, p. 344.

At the suggestion of Professor H. Ries, the writer undertook a series of experiments to determine whether the iron in clays returned to the ferrous condition as the clay was burned to viscosity in an oxidizing atmosphere. The results are given in the accompanying Table of Analysis.

Methods Employed in Burning the Clays.

The clays were first molded into small bricks and then burned in a gas furnace, care being taken to raise the temperature slowly, and to keep the atmosphere of the furnace oxidizing. As soon as the burning was finished, the burned clay was covered with powdered feldspar or kaolin to prevent oxidation of the iron while cooling. The material for analysis was taken from the inside of the brick.

Methods of Analysis.

To determine the total amount of iron, the clay was fused with sodium carbonate, the iron was dissolved in dilute sulphuric acid, and after filtering, the ferric sulphate was converted to ferrous sulphate by metallic zinc. The solution was then cooled and titrated with a standard solution of potassium permanganate. After correcting for the amount of iron in the zinc, the remainder was the total iron.

The ferrous iron was dissolved in hydrofluoric acid and dilute sulphuric acid—ratio of one to two. For this experiment an ordinary water bath was used with a triangle fitted to hold the crucible above the surface of the water. A beaker with a small hole in the bottom was inverted over the crucible in such a way that the rim of the beaker was beneath the surface of the water in the bath. The water was kept boiling while the iron was being dissolved. The time allowed varied from one to two hours. The solution was washed from the crucible into a beaker containing cold distilled water and titrated with potassium permanganate. This gave the amount of ferrous iron present; and the amount of ferric iron was determined by subtracting the amount of ferrous iron from the entire amount of iron.

The red color of most of the burned clays was due to the ferric oxide, while the yellow color of the Newfield clay was due to the presence of calcium carbonate. This yellow color of some bricks was attributed by Seger, to the formation of a complex silicate of iron and calcium. The mixture of magnetite and feldspar was black when burned, but the fine powder produced in grinding was red; and this taken in connection with the fact that the mass was non-magnetic, indicates the formation of ferric oxide.

The increase in the percentage of iron in the burned clay was due to the expulsion of water and other volatile substances in burning. All the analyses showed a decrease in the percentage of ferrous iron, and this taken in connection with the increase in the percentage of the total iron shows that the ferrous iron tends to change to ferric iron, even when the clay becomes viscous. However, with one exception (the clay from Amenia, N. Y.) there was ferrous iron present which would indicate that the oxidation of the iron in the interior of the bricks was not complete; probably because the oxygen of the air did not penetrate to the interior very readily. Nevertheless, the results show that some oxidation took place even there. From the analysis it would appear that the iron does not return to the ferrous condition except when burned in a reducing atmosphere.

While this rule holds true for ordinary clays, it might not be true for a clay containing a large percentage of carbonaceous matter, which would tend to reduce the iron to a low state of oxidation unless the temperature was raised slowly enough to drive off the carbonaceous matter. Moreover, in the case of clays burned at a very high temperature, it may be impossible to maintain an oxidizing atmosphere in the furnace; and hence the iron will naturally be reduced.

Written for The Clay-Worker.

POTTERY NEWS.

A CONTRACT HAS been placed with an East Liverpool firm for the equipment of a pottery in miniature for Mr. S. Robineau, who has an art school at Syracuse, N. Y. He is now erecting a plant which will be devoted entirely to the manufacture of extremely high-grade hand-turned art wares and tiles. The new plant will be completed within the next thirty days.

A new porcelain works is to be erected in East Liverpool shortly. Mr. P. V. Mackall, Dr. G. P. Ikert, George Kaufmann and others are the incorporators of a new company who will erect a four-kiln plant for the manufacture of electrical goods immediately. Several sites have been viewed, but none purchased as yet.

Mr. W. A. Rhodes, who was vice president and sales manager of the Colonial Company, East Liverpool, has severed his connection with that institution and will connect himself again with The Knowles, Taylor & Knowles Company of that city, with whom he was associated before entering the Colonial Company. Mr. J. S. Wilson, who was secretary and treasurer of the company has also resigned and has repurchased the Wilson Stationary Company, which he owned before entering the Colonial Company. Mr. H. W. Smith, a newspaper man of East Liverpool, will be the new secretary and treasurer of the company.

The Union Pottery at East Liverpool has been disposed of by the Union Potteries Company to A. M. Moreland for a consideration of $35,000. Mr. Moreland was formerly president of the company, and the plant and property remain in practically the same hands as before.

The Continental Clay-Products Company has been incorporated at Jersey City, N. J., with a capital stock of $100,000. The new concern will start on the construction of their plant immediately.

Work has been started upon the new plant being erected at Trenton, N. J., by the Brian Pottery Company. The plant will be quite an extensive one and will manufacture two or three different lines of goods.

The American Kaolin Company, of Kaolin, Pa., are about to erect a brick plant for the purpose of making a high-grade fire-brick from their kaolin. The contract for the equipment of the plant has been let with the Patterson Foundry and Machine Company, of East Liverpool, and will be erected immediately.

A new pottery is now under erection by Mr. John P. O'Halloran, at New Haven, Conn. The pottery will have a capacity of two kilns and will be modern in every detail. The old pottery which Mr. O'Halloran has been operating for a good many years will be torn down as soon as the new plant is completed.

The American Clay Company, of North East, Md., are contemplating some improvements at their kaolin plant at that place, but have not fully decided upon same as yet.

The kilns at the new plant of the Columbus Pottery Company, Columbus, Ohio., have been completed, and as very little more is needed to complete the plant, it is thought that same will be placed in operation before many more weeks.

The Wick China Company, of Kittaning, Pa., have assigned. The assets are placed at about $85,000, and the liabilities at $40,000. Mr. Wick's personal indebtedness is said to have thrown the concern into the difficulties.

Tom Potter.

East Liverpool, Ohio, July 11, 1904.

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[7] Bulletin No. 35, N. Y. State Museum, p. 517.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

THE FOURTH OF JULY is close at hand, and Smith, the brickyard laborer, is working as he never does at any other time during the season. He is so anxious, that he will do extra work, not because he wants the money to have a royal spree on the glorious Fourth, for the money would not last till that date after being paid on the preceding Saturday.

The week that the national holiday comes on would mean a loss of a day, and that to him means a great deal. At any other time he would think nothing of loafing two or more days, no matter how urgent the need of his services in getting in green brick. He does not care a rap for that. The day that he must lose because the yard will not run, he must make up, and all hands do their best. The setters will set in their kiln and then begin on another pit; possibly set in half of it that day, and finish it the next. They will work so that by 8 or 9 o'clock on the third of July, their work is done. The truckers will run out an extra half pit on the second, and will be at the machine by 2 o'clock the next morning, if it is moonlight. If not, just as soon as they can see the yard-line to dump by, and sometimes will not wait for good daylight. While the last half of the pit is being shoveled out, the cart man will draw the clay around the curb. Just as soon as the pit is out, and it is done, all hands are through, except the machine boy, who will edge and spat the pit. If clear, he will not waste much time waiting for the green brick to be ready to pass through his hands. The foreman is not around, and in the boy's judgment, "they will stand to edge and pat." It is the third of July, and all the rest are through, why not he. Can you blame him if he does spat them on edge when they are soft. The setter may use some swear-words but the boy does not mind that, as he is used to a little thing like that.

THE AMOUNT OF WORK

That is done at this time, to cover the Fourth, has been one of the causes of the increased number of brick to be handled all the way through. It shows that the men can handle them, if there is any incentive to do so. To one who visits a brickyard to-day and is at all conversant with the labor of trucking green brick, they must certainly think it is killing work, or the men are very foolish, or work scarce, that men should push the green brick barrow out to the hack just as fast as one can walk, then turn the handle to the hack and take off eight or ten green brick at a handful and place them on a barrow. When the barrow is loaded, rush the load to the kiln. This would be very hard work indeed, if kept up to the limit of brickyard hours, from sunrise to sundown.

Under the methods of our forefathers, the usual way for one who was wheeling brick was to throw the handle up and let the barrow run slowly along the hack, and it was no uncommon sight to see a wheeler stop and talk to some one. They knew that there was a long day before them, and if they were not bound by any cast-iron rules to get in the pit of brick, they loafed their time away. When one thinks of the long hours in the month of June, when the sun makes its appearance above the hills, about 4:30 A. M., until it drops behind the western horizon, about 7:45 P. M., or fifteen hours' actual time, is it any wonder that the face of an American is rarely seen at work on a brickyard, in any capacity, not even as foreman? No doubt the men to-day work hard, but they are not compelled to, as the time is their own, and they could go a little slower—not at a break-neck push to get through.

Half time is made by the brick setter and his gang in the long days. You see the men going home at noon, having done their day's work of wheeling in a pit of brick. It means a steady push from the first barrow of brick till the last handful is set.

CHANGE IN TRUCKING

Not in the way of running, but in the way the truckers work. It used to be the custom that after the pit was out the gang was split up; one would drive the horse that filled the pit, another leveled the pit, and so many went to the shed or did other work which was required. Now, all the machine gang runs out the pit, and then each takes his share of the whole pit and hacks them at his own convenience. It is customary to all turn in after the pit is out, and hack the brick of the day before, if they are dry enough. It is a satisfactory way of getting out the brick, and relieves the foreman of a great deal of care, as under the old way there were always some of the truckers who were not in a hurry to get their brick up. If the day should be overcast, some of the brick would not dry. Probably a shower would come, then the foreman would have to get some other men to hack them. As Saturday's brick would not be ready until the next day, and the chances would be that some of the truckers would be Polocks, they would not touch one of them. It seems to be the unwritten rule among them that no one should touch any one else's share, no matter what the outcome is, unless the boss tells him to do so.

The class of men who work on the yards to-day are no good as compared with those of twenty-five or thirty years ago. Of course, those who have married and settled down do well enough if they are Polocks and Huns, but they are not steady workers. Germans, married, are a good class of men. The Irish are the floating class, and cannot be beat. "Pat" is so addicted to liquor that you cannot depend on him. After pay-day he is likely to not put in an appearance for several days. The last class which has been brought into the labor field in the making of brick is the African, and he is a useless article. They are the worst set of loafers that ever set foot on a brickyard. Of course, he has to be domiciled by himself, and if he can manage to get money enough together to get a suit of clothes, he does nothing but dress up, and all the work he does is just enough to buy a very poor class of provisions. As he boards himself, he buys just as little as he can, and as a drinker of rum, he can outdo the Irishman, only he is too lazy to work enough to get the quantity the Irishman will; besides, the latter has credit, which he has not.

If the Italians as a class were larger men, they would no doubt take the place of all others. For certain work they are the best of men. For trucking they are all right, but for wheeling green brick, they are not heavy enough, especially as at present, a setter and three wheelers are through by noon. As for wheeling burned brick on a barge carrying 250,000 or 300,000, and ten men doing it in two days, the light Italian would not be in it. The labor problem in the manufacture of brick is getting more serious each year.

A few years ago each spring the same class of men would return, looking for work. For the last five years the return of spring brings a new set, but of the same quality. They pass away from sheer abuse, as the class of liquor they drink is enough to kill on the spot. I will quote a case which came under my eye on Sunday. As good a brick wheeler as ever tossed a load of green brick was so drunk that he fell by the roadside, and there he laid until the next morning.

The weather of late has been favorable for turning out brick, as there has been but little rain; foggy and overcast up till 10 o'clock, and then clear off.

OUTLOOK FOR BUILDING

Is improving all the time, and so far, since the strike, has been pushing ahead of last year in point of number of buildings, but not in cost. Total number of permits granted: January 1, 1904, to June 18, 1,284; January 1, 1903, to June 18, 857, a diference in favor of this year of 427 buildings.

Total cost of permits for 1903 was $47,836,625, for 1904, $41,186,535. In favor of 1903, $6,650,090. All of which shows that the class of buildings which were erected last year were more costly, and in all likelihood used more brick than those of this season.

THE BRICK MARKET

Is doing all right so far. The call is good and the price is maintained—nothing very fancy, but a fair price. But this will probably give way with freer shipments. It is one of the conditions which sometimes exists that the qualities run close together—from $6.00, $6.12½, $6.25. $6.37½ and $6.50.

A. N. Oldtimer.

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING NEWS.

THE WEATHER could hardly have been more unseasonable for building in this city than it has been up to the present time. The month of June was especially unfavorable, as the rains followed each other in such quick succession that it was almost impossible to work out of doors to any advantage. Excavations have been hard to make, on account of the soaked condition of the soil, and the unpaved streets have been in very bad condition.

In spite of these facts, the building record makes a very favorable showing, when compared with June of last year. Four hundred and seventy permits were issued during this June, which represent expenditures of $968,476; and among the buildings were 54 bricks, with a total frontage of 5,384 feet, and 172 frames, with a frontage of 2,730 feet. The value of the bricks were placed at $487,900 and of the frames at $405,190. In June of 1903 there was only 257 permits issued of a value of $414,290. This shows over double the permits issued this June, but the cause of this increase in permits was largely on account of the extremely light June of last year, when the city was flooded the first of that month, and the energies of the people turned towards clearing up the flooded district for the balance of the month.

Few large buildings are being started, but the number of homes being built is surprising, when conditions are considered.

The American Dressed Beef and Provision Company, which was recently incorporated in Chicago, with John Ruddy as manager, is said to be about to choose a location for a large packing plant in this city, and in case the building is started, it will probably be one of the large jobs of the year.

The big plant of the Nelson Morris Packing Company is nearing completion, but has been greatly delayed in construction, both by the inability of the contractors to get brick from the Kansas fields, on account of the floods, and from the rains which delayed work. This big plant, together with the large soap factory of Proctor & Gamble, are in Kansas City, Kan., and hence do not swell the building permit totals of this city, although they are just across the line, and Kansas City, Mo., gets more of the business from them.

Just at the present time prospects are not too good for business in several sections of that part of the West claimed as Kansas City territory. There is so much rain in Nebraska, Kansas and Missouri that the corn is getting sodded with grass, and the farmers are unable to get into the fields to plow it. There has been a good deal of wheat lost by the floods and rain, and hundreds of acres were cut with the old-fashioned cradles this year, as the machines would not run in the mud. In Colorado the strike of the miners has hampered building operations, as everything has been quiet out there for months, and while things look brighter in that state, they are still far from being at the normal stage. In New Mexico and Arizona there has been practically no rain for a year. In Albuquerque, N. M., they say they have had no rain for over a year, and the Rio Grande river is dry at that point. Other sections are in pretty good shape, and the nearby part of the above mentioned territory still has time to right itself.

Thomas Roberts secured the contract for a new sewer, which includes a part of the North Main street district, in Independence, Mo. Sewer work is being much delayed at this time, and has been for a couple of months, work being done whenever the opportunity is offered.

The Pittsburg Brick Company has just placed an order with the Thew Automatic Shovel Co., Lorain, O., for another of their steam shovels, this one being of the larger capacity, and having many special features which are expected to make it an ideal shovel for the handling of the shale in their plant in Sycamore, Kan. This company put in one of the lighter steam shovels made by the Thew Automatic Shovel Company at the Pittsburg plant several months ago, and in that time has been able to test its value as an adjunct to a first-class brickyard, and has decided that it fills a long felt want, as it not only handles the shale much cheaper, but as it works on a straight face, the work can go on in wet weather as well as dry.

Walter S. Dickey, of the W. S. Dickey Clay Manufacturing Company, failed to land as a member of the Republican National Committee from Missouri, but he managed to show a great deal of strength in the short time he had to try for the place, after deciding to make the effort. He came out of the fight with even more friends than he went into it, and still stands for good, clean Republicanism. He states that he is now going to devote his attention to selling sewer pipe.

The Kansas City Paving Brick and Tile Company is putting in a new kiln at the plant in Brownington, Mo., and about next fall they expect to put in a waste heat dryer, as their steam dryer has hardly as large a capacity as they now need, and they are in favor of the waste heat process.

The Kansas City Hydraulic Pressed Brick Company is reporting about all the business they can take care of at the present time, although most of the buildings for which they are furnishing brick are among the small class. The fact of the matter is, most of the big buildings being put up in this city, such as packing plants, etc., are using the brick coming from the Kansas gas belt, and as long as the smaller contracts take up the output of the local companies, at a better figure, they are willing that the big plants should buy the Kansas brick.

The Pittsburg Brick Company has received an order increasing the order for brick for the State University building by another 1,500,000. When Nebraska finds it advantageous to come to Kansas for brick, and is then so well pleased with the first order as to increase it in this way, it speaks well for the brick shipped.

The Gump Pressed Brick Company is reporting the plant, which is located near Kansas City, Kan., to be running regularly, and that Kansas City, Kan., and Northeastern Kansas is taking the product as fast as it is made.

The Kansas City Paving Brick and Tile Company now has orders for over one million paving brick on its books, for use on the streets of Kansas City, and hopes to begin making the deliveries soon. When the contractors were ready to receive the brick, some weeks ago, there was such floods in Kansas that the railroads were unable to make shipment, and when the railroads got in shape, the rains began here, and now the contractors do not want the brick until they are better able to handle them. This has made business poor to the present time, but favorable weather will make plenty of business, as everything is ready but the weather.

The Pittsburg Brick Company has landed the contract, and is furnishing 400,000 brick for the large building of the Price Mercantile Company, which is being erected on the corner of Fourteenth and Main streets.

Diltz, Courtney & Dyke are about to begin operating a brick factory in Pomeroy, Wash.

The Versailles Fire Brick and Clay Manufacturing Company, of Kansas City, Mo., has increased its capital stock from $60,000 to $75,000.

The Bentonville Brick and Tile Company has been incorporated in Bentonville, Ark.

The Western Art and Tile Company has been incorporated in Los Angeles, Cal.

The Washington Brick and Tile Company has been incorporated in Washington, Iowa. F. A. Parker.

PATENT SUIT.

Suit was brought Feb. 23, 1904, against the Hamilton Brick Co., of Hamilton, Ohio, by the Horton Manufacturing Co., of Painesville, Ohio, for infringement of their patent on their Hercules brick machine. The Hamilton Brick Co. is using a machine made by the Arnold-Creager Co., of New London and Cincinnati, Ohio, and is called by various names such as "S. S. S.," the "New Century," the "Success," etc. 5 tf L.

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CURRENT COMMENT.

If they want a really good foundation for asphalt on streets where they *will* use asphalt, why not try brick?

* * *

More effort to bring out merit and less desire for boodle might alter the street paving situation in some cities.

* * *

A tank of water mounted on a tower is a good thing to have around the place at all times, and it is especially useful in case of fire.

* * *

The building of air castles is a pleasant and profitable diversion, but it should not be allowed to interfere with regular business operations.

* * *

We all agree that honesty is the best policy, but the best man of all is the one who is just naturally honest, and is not driven to it for policy sake.

* * *

System is one of the finest things ever invented, but don't get your system machine heavy enough to cause friction or it may prove a burden instead of a relief.

* * *

How to minimize the cost of transportation is a subject that might be given associated attention to advantage, for the transportation is frequently the bigger single factor in the item of cost.

* * *

There are a number of important assets in every business that do not show on the books, but have their influence just the same, not the least among which is a friendly relation with your competitors.

* * *

The objective goal in clayworking is profits, but it is not a wise policy to increase the profits of to-day at the expense of reputation tomorrow, for the most difficult thing to repair is a damaged reputation.

* * *

To the free exchange of ideas and technical information is due no small part of the great progress that has been made in the clayworking industry the past decade, and in this work the machinery men have lent a willing hand to the mutual benefit of all concerned.

THOUGHTS WORTH CONSIDERING SUGGESTED BY THE BALTIMORE FIRE.

Are we making our brick too hard? For many purposes, no doubt we are. Brick for pavements can not very well be too hard if they have at the same time the element of toughness, but the Baltimore fire has indicated that a structure may suffer and did suffer in that conflagration from the mere fact of the brick, the terra cotta, and fireproofing being too hard. There the element of toughness did not cut any great figure unless it be in the matter of the fireproofing, and generally speaking we know that this material is quite brittle. But the brick that were extremely hard, those that were enameled or glazed did not stand the fire well. Where there was the facing of the extremely hard brick against the ordinary building brick which were not so hard, the facing brick peeled off like a veneer. In other cases the bricks themselves chipped. This was altogether independent of their being bonded or anchored into the body of the wall, and was developed by the vitreous character of the material. This tendency to make brick hard, and very hard is in response to a demand from the architect and the public. Not many years ago when brick were made in the ordinary way, the old mud brick by the hand process, burned in make-shift kilns, there was a large proportion of very soft brick and in putting up a building there was almost universally a struggle between the contractor and the owner or the architect in the matter of soft brick. This developed many controversies and often the line between a soft brick and a hard brick was hard to define. Because of the agitation growing out of these differences, brickmakers by various means have sought to make their bricks yet harder and harder, so that at present one has little or no occasion to find fault with soft brick. Yet have we not gone to extremes, are we not making face brick, pressed brick and general building brick too hard for general building purposes? Certainly we are not doing this for foundation work, where it is not exposed to heat, nor for sewers and other underground work, but for general structures above grade, where it may be attacked by conflagration, it is fair to say that we have overstepped the mark in the matter of hardness. We all know that in the construction of furnaces and flues there is a well-grounded sentiment in favor of the softer brick, and it was oftentimes the excuse of the contractor, in the earlier years, in the days when hard brick were none too plenty, that the soft brick delivered on the ground were said to be intended for the flues. Tests have recently been made by taking very hard, vitreous brick and heating them and throwing them into water. This is the test which they will receive in a conflagration, and the result is what was seen at Baltimore.

IMPORTANT FEATURES IN FIREPROOF BUILDINGS.

During the earlier days and weeks following the Baltimore fire, than which no greater object lesson in construction has been developed, in the building history of this country, we had opinions from the lame, the halt and the blind. We had opinions based upon superficial observation, or from those who were partisan and those who wished to place themselves on record early in the history of this discussion. It is only within the last few weeks that opinions emanating from worthy sources, from unprejudiced investigators, which have been the result of long, careful consideration, from men trained to do their work well, have come to us. One of the last is the address of Captain Stephen Sewall, U. S. A., delivered before the National Board of Fire Underwriters in New York. He had not a little to say on the subject of brick and clay construction, as well as general construction. He states truly enough that we have worked almost entirely on the basis of a fire originating within and that exposures have had scant attention, and the conflagration hazard, none at all. The latter statement is eminently true. He says, "Like a general on the defensive we have provided meager protection for the front, none at all for the flanks and rear, we find an active and aggressive enemy after the battle in possession of most of the field." It is his opinion that more mass is required to resist fire than to carry super-imposed loads. This is positively true. The architect, the builder and the modern engineer does not take into serious account the capacity of a wall or structural material to resist fire. There is an utter absence of formula on this question. There are no rules, there is nothing definite. The material necessary to resist fire has not been constructed in a serious way, or at all in a definite way, certainly not in the way of rules or formula by any engineer. In the craze for lightness and cheapness, in the building of tall structures, the architect is always confronted with the thought of collapse. There he has formula, there he uses the rules and data of the engineer. Not so when he comes to consider the possible destruction of this building by fire; there he has no specific data. In the literature of building there is no definite formula which relates to the fire hazard. One may have his opinions, but there is no organized expression.

QUESTIONS FOR THE TERRA COTTA MANUFACTURER.

Captain Sewall is an extremist in some points. In the matter of ornamental terra cotta, he says that if it is very ornamental it is liable to spall. It should be as simple in design as possible and of a stable and fireproof color. Just what is meant by fireproof color may be questioned. He says that the thickness of the material itself should be made greater than is common, that it should not be less than an inch and a half for the webs and other parts of the cast. All cavities should be filled with cement and mortar or concrete, and heavy projecting cornices should be tied back with steel anchors. If these precautions were observed, he states, it is possible that terra cotta may give a much better account of itself than it did in the Baltimore fire, where it suffered from general damage, and from spalling. It is undoubtedly true that care in the mixture of terra cotta has not been seriously considered from the underwriter's point of view. It has not been strongly brought to the attention of the architect and the manufacturer from this point of view. About all the architect has cared for is to get the desired color and all the manufacturer has sought has been to get the proper surface to meet the requirements of the architect, and to produce his material straight and uniform at the least expense. The mixture of clay which would require the smallest of "overs," has been the most popular with the architect and manufacturer and no great regard has been paid to the thickness of the material or the web, excepting in so far as it relates to the convenience and cost of manufacture and assembling.

THE IMPORTANCE OF PROPER CONSTRUCTION.

Captain Sewall is right in his proposition that the material of outer walls should be first-class brick work, but what is first-class brick work, when considered from all points of view? He says that the brittle, dense face brick made by the dry process spalled rather badly at Baltimore, and the same was true of the enameled and extremely hard bricks. Face bricks bonded to the wall only by metal ties were stripped from the walls in large areas, as especially emphasized in the Continental Trust Building. It is this engineer's thought that brick should be made of good, refractory clay burned to the point of maximum toughness, but not to vitrification. The experience in Baltimore was, that brick laid in cement mortar and bonded with real headers fared the best. There is no question that walls so constructed, of sufficient thickness, are the ideal barrier to fire, and it is eminently true that stone is no longer to be considered in any building as a heat resistant. The Baltimore fire proved that most walls were too light. Captain Sewall's thought is that the thickness of an outside wall should be the length of two bricks, these from sixteen to eighteen inches. Outside walls only a brick and a half thick were badly cracked at Baltimore. They had not mass enough, yet their behavior indicated that another half brick would have made them thick enough, in the upper stories, at least.

THE THICKNESS OF BRICK WALLS.

The Baltimore fire has developed from engineering authorities, considerable criticism of the typical steel skeleton structure for exterior walls. The engineer from whom we are quoting, is strong on this point, and makes a strong appeal that they should be from the foundation up well anchored to the steel frame by heavy ties at short intervals. This is antagonistic to the usual method of considering curtain walls, which have under supports of girders at each story which carry their load to the columns and from the columns to the footings. The appeal of the engineer is for the homogeneous mass not liable to be thrown into the street by expansion or twisting of the beams. It would interpose a greater thickness of protecting material between the steel and all external agencies of destruction. This would require more time to build, for the work could not be started in different stories at the same time. These are objections which Captain Sewall mentions and also the question of eccentric loading of walls if the weight of the wall is taken off of them. He affirms that the brick wall over three hundred feet high, and of uniform thickness is safe enough under its own weight, if it is secured against the buckling as it would be if anchored to the frame. Such a wall should be thicker in the lower stories for fire resisting purposes, but in no case will it be necessary to make any part of it more than three and a half bricks thick even in the lowest stories if the work is well done. This is the opinion of Mr. Sewall, and he further states that the steel saved in the walls and spandrel beams would almost pay for the extra thickness of brick. This latter fact may be questioned but on the whole is good engineering.

THE WEAK POINT IN HOLLOW TILE.

The general opinion that anything in the way of a hollow tile is all right, received a quietus in the Baltimore fire. Hollow tile are placed in buildings for floor and partition purposes with little thought as to their composition, their general construction, the method of adjustment and certainly never with any positive analysis as to their toughness and their capacity to resist great heat. Hollow tile as used for the protection of beams, is generally insufficient on the under side of the beam. Where the most protection is desired, where the most protection should be, there we have the least. In the middle of the floor we may have eight or ten inches from the top to the bottom of the tile, under the beam we may have one and one-half or two inches. Where the strain is the greatest, where the most protection is desired, the least protection is given. We will have to take another thought on the question of hollow tiles.

THE MORE BRICK AND THE LESS STONE USED THE BETTER.

Another point made in this paper is that even good brick are liable to spall on the corners where exposed to fire, and it is suggested that as far as possible therefore, all salient angles should be to a radius of a least three inches if liable to exposure. This idea is applied to other forms of masonry including concrete as well as brick work. Again recurring to the thickness of the wall, a minimum of two bricks in the upper stories is suggested with a reasonable increase below. Carrying out this idea it is suggested, better results will be obtained, by building the walls continuous from the foundation up, stone should be reduced absolutely to a minimum, terra cotta should be heavier and of plain design and stable color, brick must be the prevailing material and they must be hard and tough but not vitrified. They must be bonded with real headers, openings must be as small as possible, finished with brick arches and bull-nosed bricks as far as possible. Vitrified roofing tile are suggested for roof coverings. The world will not stand for Captain Sewall's suggestion that the width and general size of openings of the exterior be reduced to the minimum. Our people will not stand for small openings. They will burn first. The question of the opening remains to be solved. Steel shutters certainly will not do, wood shutters with metal coverings are not wholly satisfactory. Captain Sewall had an utterly impracticable suggestion that shutters be run into a head or pocket above the window and that they be of steel plates. Here it is that Captain Sewall nods, if he does not drop off of the chair. In the first place the spandrel head is not high enough to receive metal plates unless they be in a number of sections. In that event he reduces the effective thickness of the wall. In this matter this engineer is getting out of his bailiwick, and as it is with all the rest of us, we fail when we step outside of our own sphere.

STOCKING UP.

Get out the well known phrases
And pearls of oratory,
Such as "Like one who gazes
Down vistas lit with glory,"
"The bulwarks of the nation,"
"The star that will not wane"—
It's time for preparation;
We've opened the campaign.

Get "Movement of aggression,"
And "Party's peerless leader,"
"The shadow of secession,"
"From palm to pine and cedar,'
"The courage of convictions,"
"Our legislative halls,"
"Malicious, greed-born fictions"—
Shake out the camphor balls.

Run up "The grand old banner,"
Unsheath "The gleaming saber,"
Rehearse the proper manner
Of calling voters "Neighbor";
Find "May my right hand wither
If I forget my pledge!"
Go, bring these phrases hither
To set our teeth on edge.

"The conflict, with its clamor,"
"The men of might and muscle,"
"The arm that wields the hammer"—
It's time that you should hustle.
Awake, you campaign speakers,
Get "With prophetic scan";
And all you office seekers,
Get 'Office seeks the man."

Get out the well known phrases
Let "Freedom tell her story,"
Get "Conduct that amazes,"
And "There she flies—Old Glory!"
Get "Helmsman, true and steady,"
And 'Shall not be in vain"—
It's time your speech was ready;
We've opened the campaign.

W. D. N.

NIGHT.

When you have walked the weary way—
The weary way that leads by noon
And takes you to the end of day,
You know there waits for you a boon;
You know that on ahead is rest,
For roses drip with twilight dew
And all things seem but for the best
When Night holds out her arms to you.

When Night holds out her arms to you,
You know your cares have found release;
That what stern battling you must do
Is for the time bid pause by peace;
For down the slopes the shadows drift
And singing breezes falter through
The silence where the hills uplift—
And Night holds out her arms to you.

When Night holds out her arms, it seems
As though she brought each one a crown—
A crown of happiness and dreams.
She comes to countryside and town
With poppies in her dusky hands
And poppies in her garments, too;
And gracefully she comes and stands
And holds her soothing arms to you.

—W. D. NESBIT, *in the Chicago Tribune.*

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I HAVE NO brickmaking troubles of my own now, but, as the woman said about babies, "I've had 'em, and I know."

Tell me your troubles. I have knowledge and experience for sale. That's all.

WILLARD D. RICHARDSON,

Consulting Engineer to the Brick Industry.

See pages 70 and 79.

WANTED, FOR SALE, ETC.

FOR SALE—One Quaker Steam Power Brick Machine, Pug Mill, and Potts Mould Sander, all in good condition.

BUTTE SEWER PIPE AND TILE CO.,
7 1 d Butte, Mont.

POSITION WANTED—By man who understands bodies, glazes and enamels for earthenware, china, electric porcelain, brick, tiles, etc. State of California preferred. Proof of ability given.

BENT,
7 1 c Care Clay-Worker.

FOR SALE AUGER BRICK MACHINES.

One American Clay-Working Co,'s No. 23 Low Frame Combined Side-Cut Machine with long pattern Oscillating Cutter, to cut 22 brick, with 18-ft. separating table, $600.00.

One Raymond 777 Side-Cut Machine with Automatic Side Cutter, $400.00.

One Wonder Side-Cut Brick Machine, without Cutting Table, $250.00.

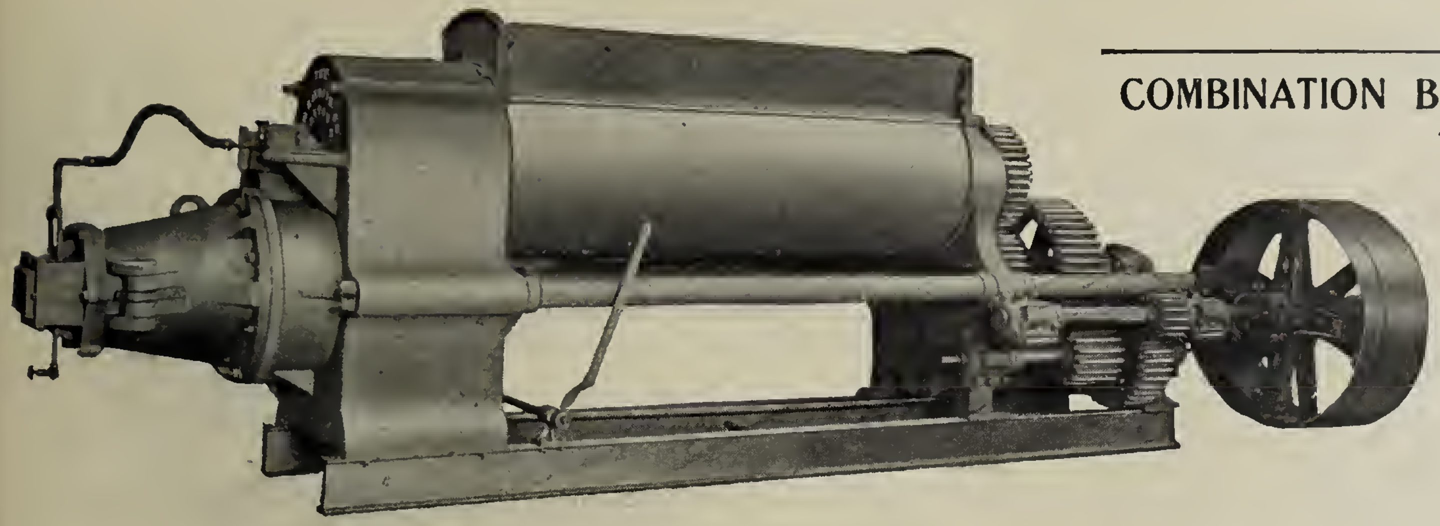
One Steele & Sons' "Extra" End Cut Machine with Automatic End Cutter, $300.00.

One Penfield Semi-Automatic Side-Cut Table, $150.00.

One style "F" Frey-Sheckler Double Geared Pug Mill, with 10-ft. tub, $150.00. Address

PHILA,
5 2 L Care Clay-Worker.

For Sale, Wanted, Etc., Ads Continued on Pages 69 and 70.



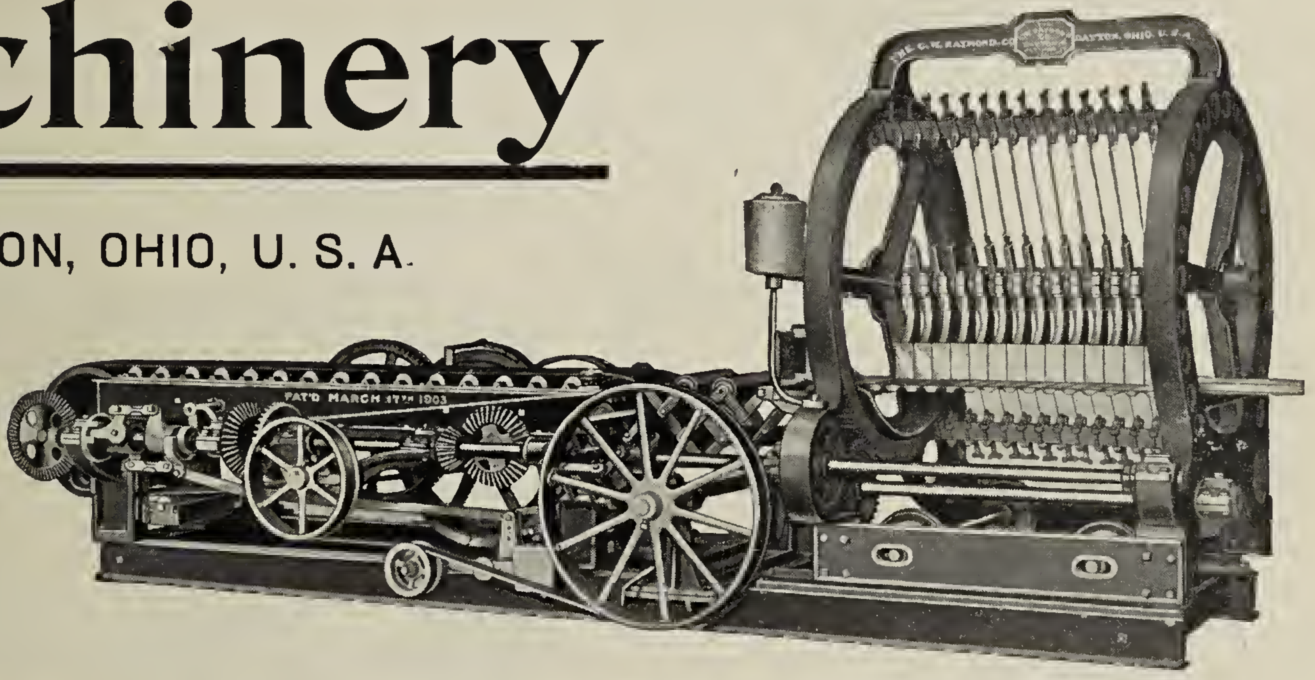
COMBINATION BRICK MACHINE

THE
C. W. RAYMOND CO.

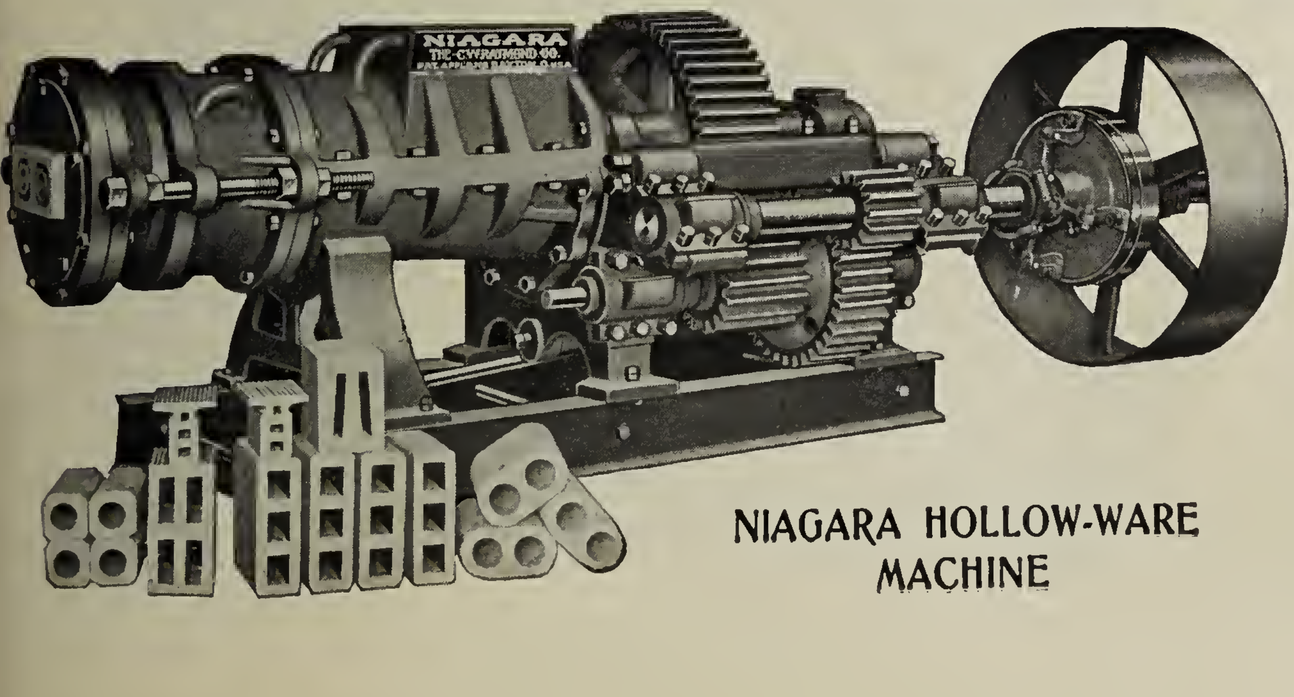
Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street
ST. LOUIS
315 Frisco Building
PITTSBURG
1425 Park Building



AUTOMATIC DOWN-CUT CUTTER



NIAGARA HOLLOW-WARE MACHINE

Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Written for THE CLAY-WORKER.

CAPITAL BRICK AND BUILDING NEWS.

AS WAS PREDICTED a few months ago, the brick and building business of the District of Columbia has developed in good shape here. All the brick factories are in operation and some have much more work than can be kept up with. The ratio of building business is not so high in Washington as in some other cities—New York, for instance—but the brickmakers here are pretty well satisfied; and it is stated that business, though so good now, will be still better next year.

The cost of material, particularly in the matter of iron and steel, has had a retarding influence in building matters; but the manufacturers of metal framing are now seeking orders, an evidence that prices in these interests must soon be reduced. In the matter of brick prices there has not been much change—although these differ with some brickmakers here. The writer was informed by one brick company that its salmon product was selling at $6.50, and common red brick at $7.50. Another company sells the same kinds at $7.50 and $10.00, respectively.

One (temporary) interference with the sale of new brick is the use of a great deal of old material, brick obtained from recently torn down old structures. The larger quantity of these came from the demolished buildings on square 690, which is the site chosen for the big office edifice to be erected for use of congressmen. The business of the House of Representatives has outgrown the Capitol's accommodations, and soon each member of Congress will have an office all to himself. And, perhaps, for fear that he might be waylaid and importuned if he walked openly from Capitol to office, a tunnel ("the statesman's subway") will be constructed between the two edifices.

Many of the old brick now being used here are from houses removed to make room for the site of the new union station. This is to be an immense structure, and one of its features at the present stage of progress, is rather unique. This is seen in the foundation piers which will support the roof over the waiting room. The piers are partly completed; they are composed entirely of concrete, and when finished will be each (there are four of them) 120 by 150 feet in dimensions. The outer walls of the union station will be of stone; the tunnel approaches are to be lined with light brick.

A new feature in clayworking for the Washington market—and elsewhere—is the making of a new brick tile by the American Hygienic Brick-Tile Fireproofing Company. This company owns the patent for the tile invention, and also will make all kinds of clay fireproofing for lining walls, ceilings, etc. The new tile has numerous hollow spaces, and it is claimed for it that by having fire in the cellar of the building where it is used, plaster can be applied during the coldest weather. The machinery employed in making this has capacity of at least eight tons per day. The company is also making the Haverstraw brick, and has a contract for furnishing 3,000,000 common brick for the Washington city pumping plant.

While there is a great deal of building going on in the District of Columbia, for private parties and companies, the big government structural enterprises dwarf everything in this line. The department house "craze" has been gradually wearing off, although this is still manifest, but in somewhat different shape. A recent project in this particular is the purchase by the Sanitary Housing Company of a large block of land on which will be erected a row of seventeen two-story flats for sanitary homes for the poor. (Of course, the 'poor" will pay for the privilege of living in these "sanitary" homes.) Each flat in a building will consist or three or four rooms and a bathroom, and will rent for from $7.00 to $8.00 per month. However, this is reasonable rent—for this city. The sanitary feature of these flats, possibly, will be found in the bathrooms. There is no reason why the poor shouldn't bathe, even if it is sometimes necessary—when the Potomac river goes into the clayworking business—to wipe off the wetness with a trowel.

The two-flat building is also claiming attention here.

So it seems that the poor will be well-flatted—but never flattered.

It is possible that, according to population—excluding the foreign "bee hive" cities, such as New York and Chicago—there are more renters of houses and flats in Washington than elsewhere in the whole country.

The structural progress of this city is due, in a large measure, to the money and efforts of the building speculator.

The great building enterprises of the year, as above mentioned, belong to Uncle Sam of the plethoric purse. The largest of the edifices here concerned will be the new National Museum. The ground upon which this will stand—located in the Smithsonian Park near the north side—is now being made ready for the foundations. Many of the beautiful trees of the park have been cut down, and others will be, to make room for the immense structure, which will be next to the Capitol in the matter of frontage space. Beginning west of Ninth street it will stretch toward the west a distance of 565 feet. In outer appearance, the plans suggest a one-story and attic building, but in some parts there are four stories. An idea of the great size of the edifice is obtained from the fact that the floor space will equal about nine acres. The exhibition halls will be very capacious and extend upward to the roof; the lecture hall will have seating capacity for 1,000 people. A very handsome building this will be; and a very handsome amount will be paid for it—$3,500,000.

The appropriation for the Washington Navy Yard, over $500,000, has just become available. Among the many improvements for which this money will be spent, and where brick will be more or less employed, are those for the new power plant, to cost $134,964; electric plant building, $97,983; wall around part of the yard, $32,000; pipefitters' shop, $20,000; cold storage and handling plant, $19,084; light plant extension, $5,000.

This work is in connection with the new extension of the navy yard, and is done under direction of the naval officers stationed there. The government hires the laborers, buys the materials and carries on the improvements, without the assistance of contractors. It is said that this system has been found more satisfactory, and will enable the officers to begin new improvements without the delay incidental to advertising for proposals and making contracts.

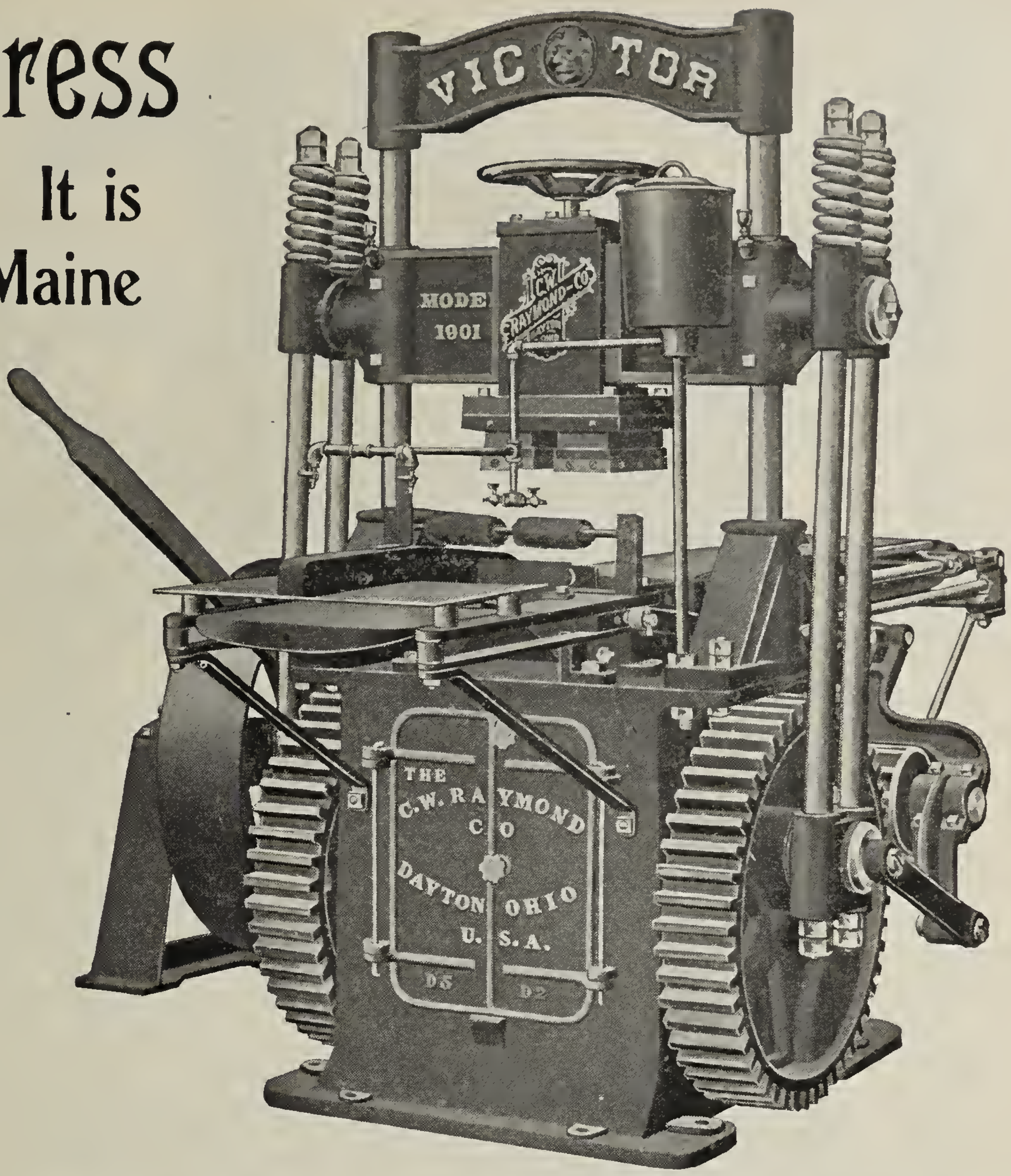
SEEDLESS APPLES ON BLOSSOMLESS TREES.

Horticulturists are Interested in Unique Exhibit from Colorado at the World's Fair.

SHARING honors with the wireless telegraph, smokeless and microbeless water at the World's Fair is an exhibit of seedless apples, California contributed some seedless oranges and Florida seedless pear, but it remained for Colorado to produce an apple without a core. Not only has this fruit an absence of seed, but the tree upon which it is grown is blossomless. Mr. John F. Spencer of Grand Juncton is father of the species and he says that the seedless apple is also immune from the ravages of insects. Hortculturists who visit the World's Fair are greatly interested in the exhibit, as the culture of the fruit is regarded as an important discovery. Mr. Spencer is now experimenting with the various varieties of apples and he believes that he can develop a seedless winesap, a seedless gano and other favorite species. If he is successful it is likely that other fruit growers will follow his example. It is claimed that the seedless apple is not hurt by the frost because it has no blossoms. It is a hardy grower and thrives abundantly in the Colorado climate. These advantages in its behalf recommend it to all orchardists. The Spencer display is made in the Colorado exhibit in the Palace of Horticulture. Several bushels of the fruit are in cold storage and the supply is constantly kept fresh.

The Victor Re-Press

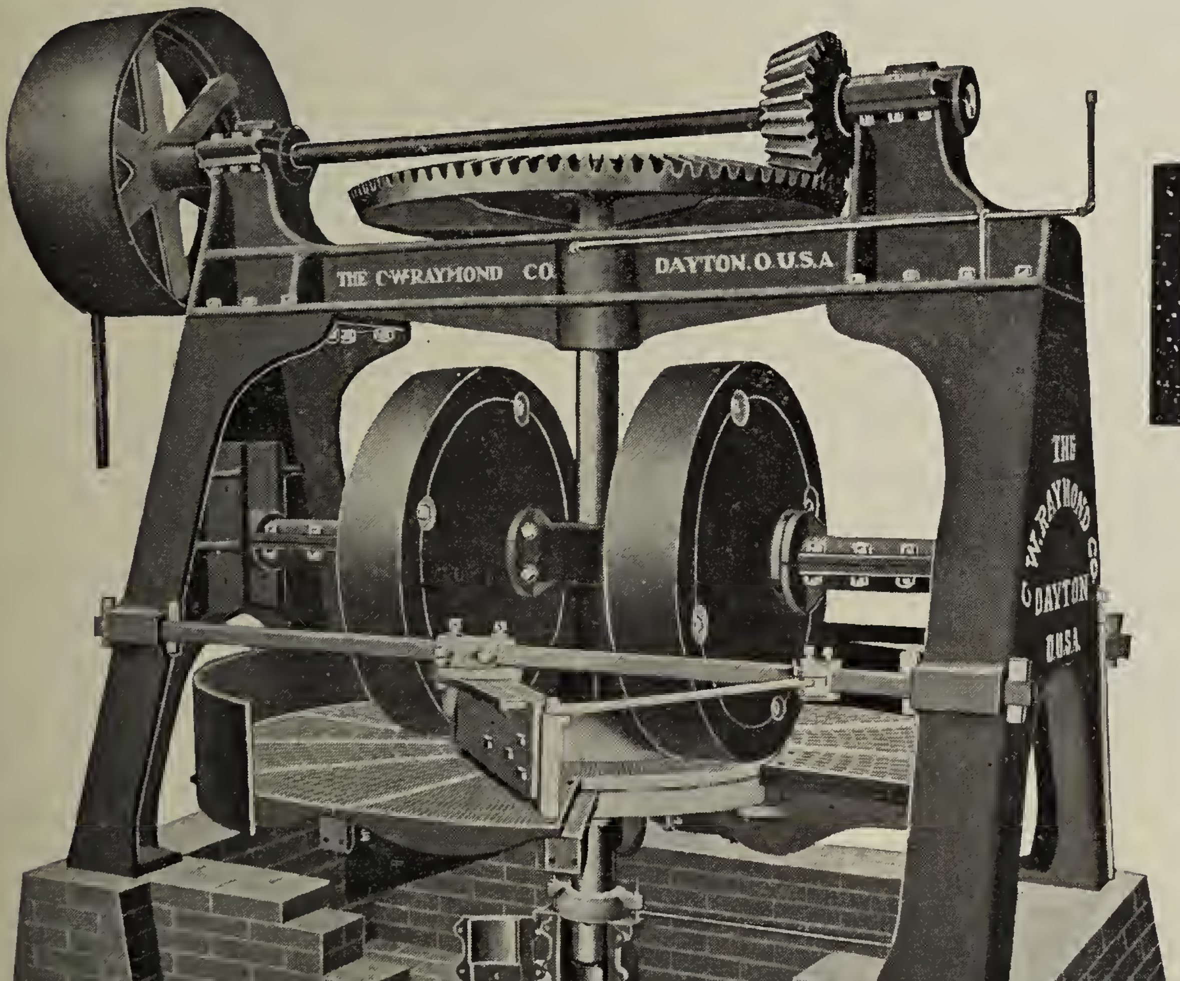
needs no introduction. It is known and used from Maine to California, ⁕ also, somewhat in Europe, Asia and Africa.



Our Dry Pan

has more crushing power, and more screening surface than other pans--heavier too

Investigation will Prove it.



THE C. W. RAYMOND CO.

Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street

ST. LOUIS,
315 Frisco Bldg.

PITTSBURG,
1425 Park Bldg.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

BUILDING OPERATIONS are particularly active at this time in southern California, in and about Los Angeles, while in San Francisco there are not as many new building contracts as at this time last year, but work is progressing favorably and conditions are still good. The demand for pressed brick and terra cotta work was never greater than it is at the present time, and the outlook is good for a prosperous fall business. The Steiger Terra Cotta and Pottery Works are having a good run on terra cotta lines, and report an especially good demand for pressed brick, so much so that they have all the pressed brick orders they can handle. They have several big jobs in terra cotta work coming up soon. They are just commencing the shipment of terra cotta for the First National Bank in Berkley, Cal., also for the addition to the Menlo Park Seminary, at Menlo Park, Cal.

Gray Brothers, large brick contractors of San Francisco, have located and staked several gold claims in this county.

Parties in Los Angeles, Cal., have become interested in the report of finding a clay-bank on the Huyck property in Santa Barbara County, California, such as potters use in the manufacture of wares, tiles and terra cotta. Samples have been asked for, that experimental tests may be made to prove its value for the purposes named.

Chicago parties are examining clay-banks in the vicinity of Everett, Wash., with a view of establishing a pressed brick and paving brick plant there. If samples of the clay prove satisfactory, a company with a capital of $40,000 will be formed. Julius Gobeaux is interested in the undertaking.

A new pottery plant, which will be devoted to the manufacture of clay cooking utensils, will soon begin operations in Oakland, Cal. The enterprise will occupy the Roeth building, at the corner of Third and Clay streets. C. W. Barlow is president of the company.

It is reported that the Southern Pacific Company is to erect a tile factory on Stony Creek bottom, near Arland, Cal.

The first full kiln of white-glazed ware burned by the Palouse Pottery Company, at Palouse, Wash., was drawn last month, and is a success in every respect. The kiln contained 9,000 gallons, all of which was in good condition. G. W. Swartwood, secretary and treasurer of the company, states that it is probable the company will double the producing capacity of the plant this fall. The wheel capacity is ahead of the kiln capacity now, and to double the output it will only be necessary to build another large draft kiln and put in two or three more wheels. Potters' clay of the best quality in inexhaustible quantities is within easy reach. The company will ship a carload of ware to Portland in the near future, a car to Chehalis, and one to Seattle, Wash.

It is reported that a strong combination of Eastern capital, which has been seeking for a deposit of fireclay in the vicinity of Salt Lake City, Utah, for some time past, with a view to establishing works in that city for its manufacture into firebrick and kindred articles of commercial value, has been successful in its search. M. J. True, who is the local representative of the syndicate, verifies the report. He admitted that one of the largest and best deposits of the material to be found in the United States has been secured, and the arrangements were well under way for its utilization. The property, which covers 1,000 acres of land in Utah County, is located about three miles from the line of the San Pedro railroad and thirty miles from Salt Lake. Tests have been made of this fireclay, showing that its resistance to the highest heat attainable by coal or coke blasts is everything that could be desired. Analysis made of the material show it to contain 76 per cent. silica, 18.3 per cent. alumina, 1 per cent. lime, a trace of magnesia, and 1.5 per cent. iron, which makes it the equal of the Trenton clay of New Jersey, a class that has long been considered the standard fireclay of the United States.

While running a tunnel 200 feet into flint fireclay in the Pacific Clay Manufacturing Company's deposits in the Santa Ana Mountains, near Colton, Cal., a vein of plastic flint clay was struck. The company now has at its disposal large deposits of both plastic and non-plastic clay. The company owns sixty acres of clay-bearing lands in the nearby range.

The Richmond Brick Company, which was organized a few months ago, and whose plant is located just to the east of the southern end of the Santa Fe tunnel at Point Richmond, Cal., has found it necessary to enlarge its plant. The company has decided to build a plant with a greater capacity than the old one. The machinery for a patent continuous kiln, with a capacity of 800,000 brick, has been ordered, and is now on the ground ready to be placed in position. The kiln is to be 150 feet long and 60 feet wide.

The Kern County Brick and Contract Company, of Kern, Cal., has started up their yards after a year's shut-down, in which time it has worked off its immense stock of brick they had accumulated. It is reported that the company has contracted to construct four additional pumping stations on the Standard Oil Company's pipeline, each of which will require 350,000 brick.

W. B. Gilbert, promoter of the California Brick and Pottery Company, of San Francisco, is accused of fraud and deceit in a suit filed against him and the corporation by Mrs. W. D. Robinson and Mrs. C. W. Robinson to recover money which they invested in the enterprise upon his representations. Gilbert's description of the future of the company led them, they say, to invest $3,500, with the understanding that he would put in $3,000 of his own cash. They now claim that Gilbert never had such a sum of money and that he was playing a confidence role when he told them of his wealth.

The Denny Clay Company is progressing with its plans for combining its several plants at Taylor, Wash., on the Puget Sound and Columbia railroad, but it is not determined as yet when all the plans will be completed. At present part of the work of the company is done at Van Asselt and part at Taylor, and the purpose is to unite the two at the latter place for greater convenience. At Taylor the company is mining both clay and coal, the latter for fuel, and there are now eight kilns in operation.

The Downar & Coleman Brickyard will soon open its first kiln of brick. The yard is located at Point Richmond, Cal.

The new brickyard on lower Jewett avenue, Goldendale, Wash., is in full operation. A kiln of 100,000 will be set and burned by July 15, and another in September, if the clay makes good brick.

SUNSET.

San Francisco, Cal., July 5, 1904.

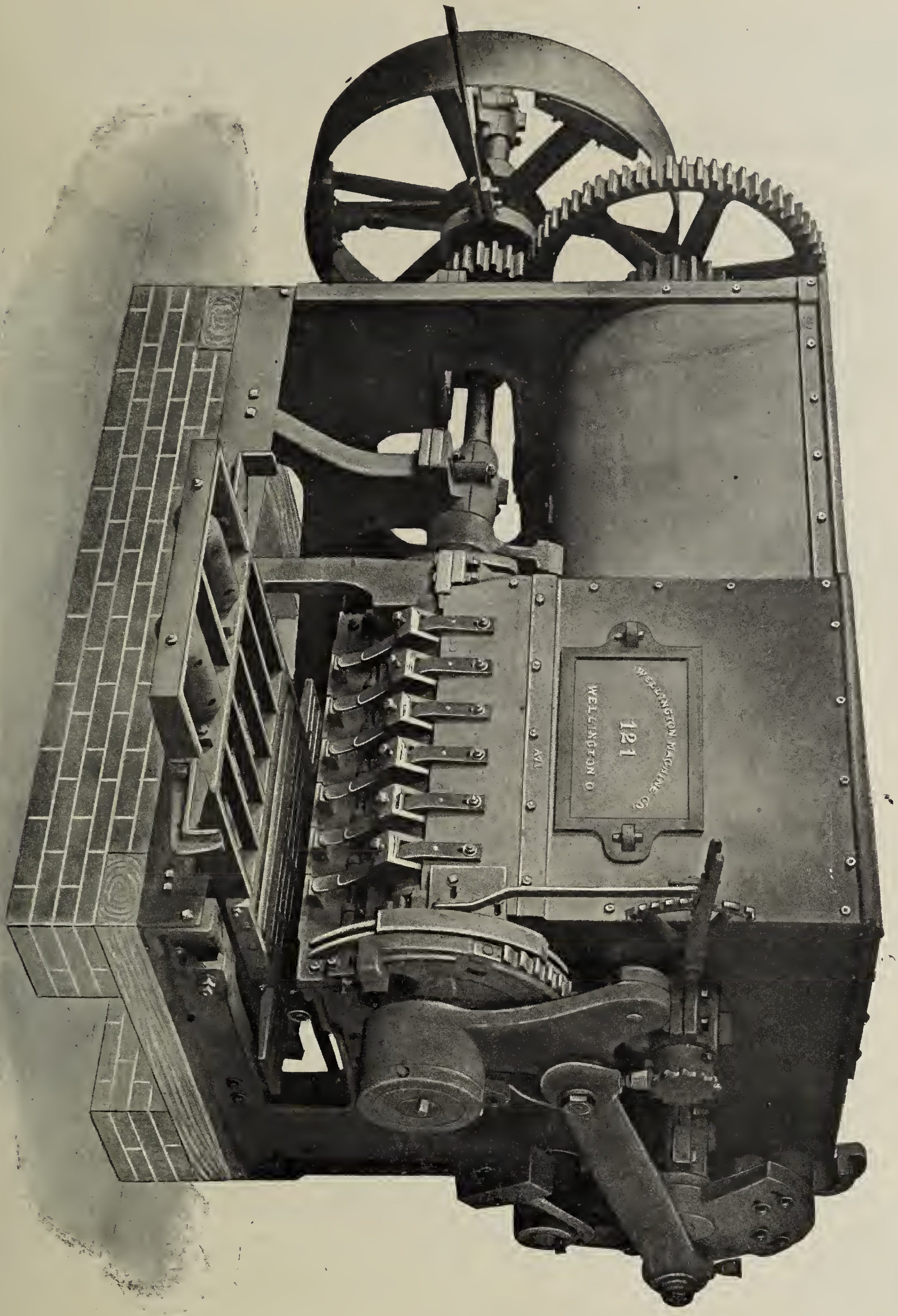
ONE OF THE MAC'S.

Patrick—"Phwat's th' name av th' bur-rd, Sandy?"
Sandy—"Macaw."
Patrick—"G'lang wid yez! A bur-rd wid a nose loike thot named McAugh? Rade th' soign agin, Sandy." —Judge.

OVER
175
"Monarch"
Brick
Machines
in use.

OVER
500
"Quaker"
Machines
in use.

WRITE
to us
regarding
Disintegrators,
Pug Mills,
Mould
Sanders,
and Dryers,
Smooth-roll
Crushers,
Moulds,
Barrows,
Trucks,
Winding
Drums,
ump Carts,
Elevators,
ump Tables
and all
kinds of
Kiln
Castings.



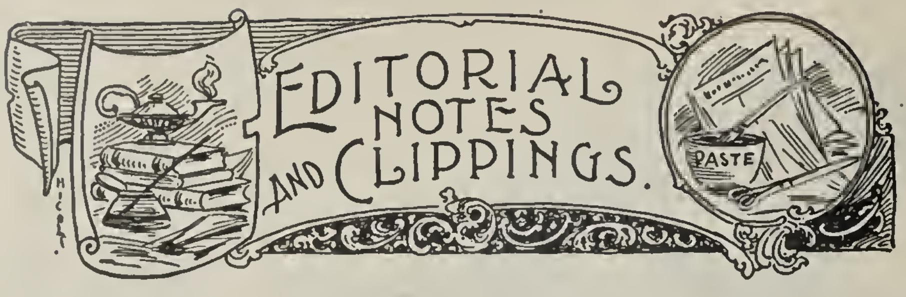
The "Big No. 6" "Monarch" Brick Machine.

REMEMBER:
You are losing money wheeling brick unless you have our
ROLLER-BEARING BARROWS.

The Wellington Machine Co.,

WELLINGTON,
OHIO.

Send for Catalogue.



EDITORIAL NOTES AND CLIPPINGS.

Oxford, Iowa, is to have a new brick and tile factory.

Joplin, Mo., is to have a new brick plant of 100,000 daily capacity.

J. B. Gerry, Grenada, Miss., is in the market for brick machinery.

T. E. Smith, Jr., will erect a brickyard on his farm near Donalds, S. C.

A new brick and tile factory is being erected at Center Junction, Iowa, by James Leach.

The brick plant of A. G. Haven, Sangerfield, N. Y., was slightly damaged by fire recently.

Chas. Klose & Co. will build a new brickmaking plant at Aurora, Neb., of 50,000 daily capacity.

The Lewiston (Pa.) Brick and Supply Company has been incorporated with $40,000 capital stock.

Peru, Kansas, wants a brick manufacturing plant. Interested parties should address W. A. Tanksley.

R. Melcher will put in some new machinery at his pottery and flower-pot factory at Weatherford, Texas.

J. W. Hall, Des Moines, Iowa, desires to correspond with manufacturers of dry press brick machinery.

A large shed at the brick plant of Robert Glass & Co., Troy, N. Y., was burned recently causing a small loss.

The Grenada (Miss.) Oil Company will erect a plant for the manufacture of sand-lime brick in the near future.

Action & Kilgore will establish a brick plant at Alvin, Texas. Work on same will be pushed as rapidly as possible.

Julius Gobeaux is having tests made of the clays of Everett, Wash., with a view of erecting a pressed and paving brick plant.

Robert Rainsdell, brick manufacturer at Sterling, Ill., will build twelve new houses for the use of the employes of his brick plant.

The tile factory at Williamsport, O., has been purchased by Kefever & Kreeger, of Stoutsville, Ohio, who will move it to the latter point.

Three men were killed and several others severely injured by a cave-in at the clay bank of the Troy Brick Company, Troy, N. Y., recently.

The Benton (Ill.) Brick Company has been incorporated with $15,000 capital. F. O. Hamilton, Walter W. Williams and W. H. Hart are interested.

The Northwestern Lumber Company, Stanley, Wis., will start a brickyard at that place, which will be equipped with up-to-date machinery and appliances.

The plant of the Terre Haute Brick and Pipe Company was damaged to the extent of $2,500 by fire, July 10. The loss is partly covered by insurance.

The machinery and part of the plant of the Evansville (Ind.) Pressed Brick Company was destroyed by fire July 14. The loss is heavy, but covered by insurance.

The Muskogee Vitrified Brick Company will add a paving brick department to their plant at Muskogee, Ind. Ter. W. J. Lanston is the general manager of the works.

All the brick manufacturers at Winnipeg, Manitoba, are very busy at present. The Fort Williams Brick and Tile Company, Gowanlocks Brick Company and the Mt. McKay Brick and Tile Company are all reported as working up to their full capacity to fill orders.

The Champion Brick Company, a Baltimore, Md., concern, has been awarded a contract by Contractor John Pierce of New York, for 5,000,000 bricks for the Academy Building of the United States Naval Academy, at Annapolis. Mr. S. A. Klein, treasurer of the Champion Brick Company, says that there has been no big increase in the price of brick since the fire and prices are now about normal. During the latter part of last year the brick trade was dull and there was a big slump in prices. Since the fire values have gradually recovered, they are now only where they were some time ago and there is absolutely no probability of a scarcity of bricks in Baltimore.

The Blake Lumber and Coal Company, Wolcott, Ind., are in the market for some iron molds for making concrete sewer pipe.

The Charleston Tile and Brick Company, Charleston, Ill., has been incorporated by S. H. Record, F. R. Dunn and C. H. Jeffries, with $20,000 capital stock.

The Blackhawk Pressed Brick Company, Sears, Ill., has certified to a change of name. The company will hereafter be known as the Blackhawk Clay Manufacturing Company.

The Champlain Brick Company, Schnectady, N. Y., is running to its full capacity, employing sixty-eight hands and manufacturing 86,000 bricks daily. During the month of June the output was 2,100,000.

George O. Berry, Sr., a prominent brick manufacturer of Columbus, Ga., was severely injured by being knocked from a street car by a passenger who was struck by a trolley pole as he leaned too far from the car.

The South River (N. J.) Brick Company has been incorporated by John Dailey, South River, and Harmon W. Cropsey and L. G. Mitchell of Brooklyn, N. Y. They will mine and deal in clay and other minerals.

The Itasca Brick Company has been organized at Grand Rapids, Minn., and will soon have a plant in operation. The company is composed of George E. Kremer, M. McAlpine, M. Ponte, G. E. Myers and Aug. Johnson.

The Ross-Keller Triple Pressure Brick Machine Company, of St. Louis, Mo., have completed a four-mold plant for the Poteau Pressed Brick Company, of Poteau, I. T., and the first kiln of brick is now being burned.

The Bentonville Brick and Tile Company, Bentonville, Ark., has been chartered. The directors of the company are James W. Perrin, F. M. Bates, E. S. Wilks and T. M. Wyatt and J. D. Core. They have $20,000 capital stock.

The Fernholtz Brick Machinery Co., St. Louis, Mo., report a very good business. They are now installing a plant for Hughes & Aaron, Natchiloches, La., and one for the Indianola Brick and Tile Company, Indianola, Miss.

The New York Blower Company just issued a new pamphlet on Peerless Ventilators. Those interested will do well to write them for one. They show some new and improved shapes. Their temporary office is still at 25th Place and Stewart Avenue, Chicago.

The Owensboro Ceramic Pottery Company is the name of a new concern lately organized at Owensboro, Ky., of which Wm. F. Keates is general manager. Mr. Keates had charge of the collection and installation of Kentucky's clay products at the World's Fair.

The Utah Fire Clay Company has been incorporated at Salt Lake City, Utah, with $200,000 capital stock and will at once erect a large plant for the manufacture of fire clay products. A large number of prominent business men of the city are interested in the project.

The Ross-Keller Triple Pressure Brick Machine Company, of St. Louis, Mo., are now shipping a complete four-mold outfit to the Pelican Pressed Brick Company, Ltd., of New Orleans, La. The equipment will be installed on their yard at Port Vincent, La., during the next few weeks.

D. B. Record, H. Y. Bready, of Baltimore, Md., and J. L. Conard, of Trenton, N. J., have filed articles of incorporation for the Hartford Brick Company. The company is capitalized at $100,000 and will acquire the business and goodwill of the Delta Brick Company, Hartford county, Md.

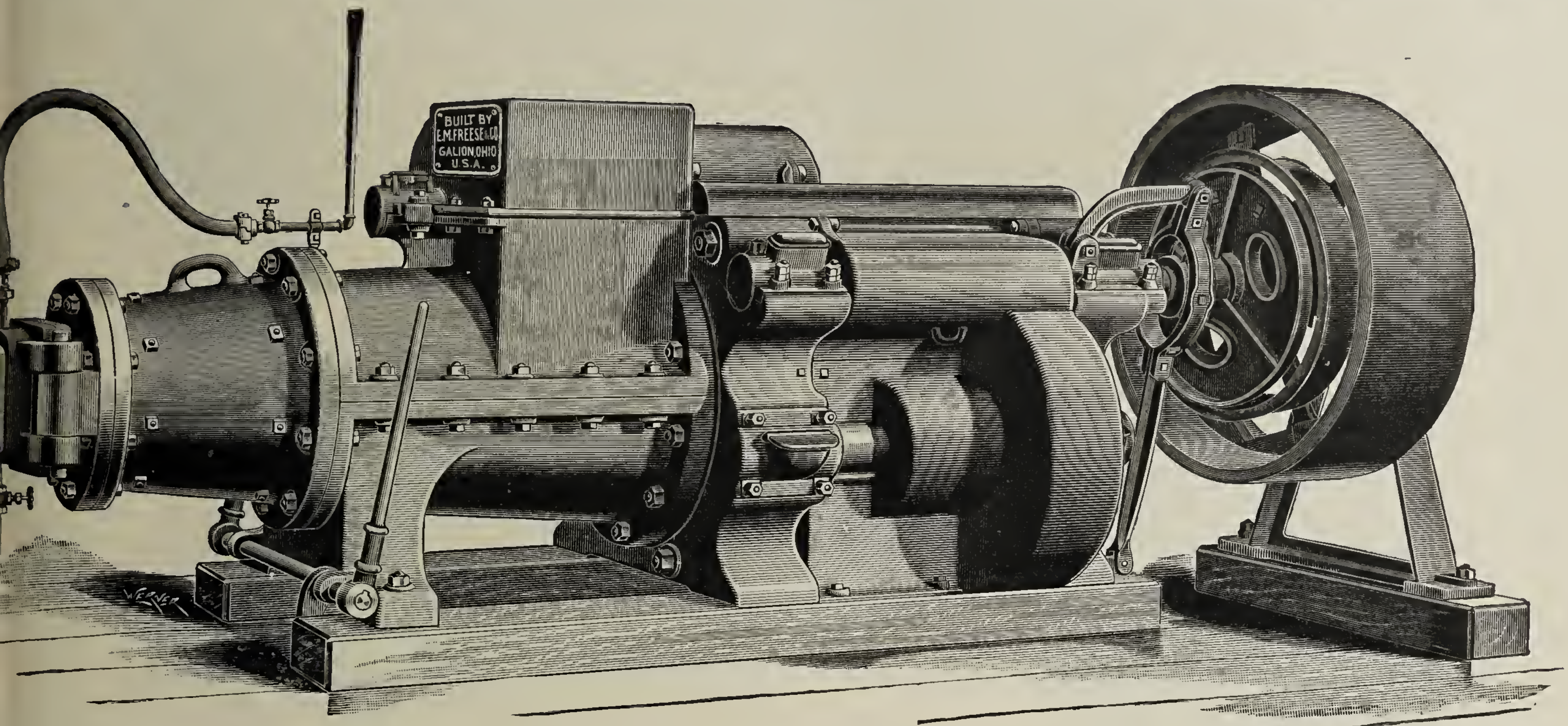
The Saginaw (Mich.) Pressed Brick Company and the Michigan Sand-Lime Brick Company at Carrolton, Mich., have consolidated and the firm will be known as the Saginaw Pressed Brick Company. The sand-lime plant is equipped with the Huennekes system and has a capacity of 20,000 brick daily.

The litigation which has been retarding the development of the Ogden Sewer Pipe and Clay Company, Salt Lake City, Utah, has been amicably settled and the plant will now be enlarged and improved and the business of the concern extended. W. S. Dickey, of Kansas City, is the principal owner of the plant.

The plant of the White Hall Sewer Pipe and Stoneware Company at Whitehall, Ill, which was completely destroyed by fire March, 1903, has been entirely rebuilt and work was resumed July 1st, just one year after the actual work of reconstruction was begun. The plant is modern throughout and is equipped with up-to-date machinery and appliances in every department. When

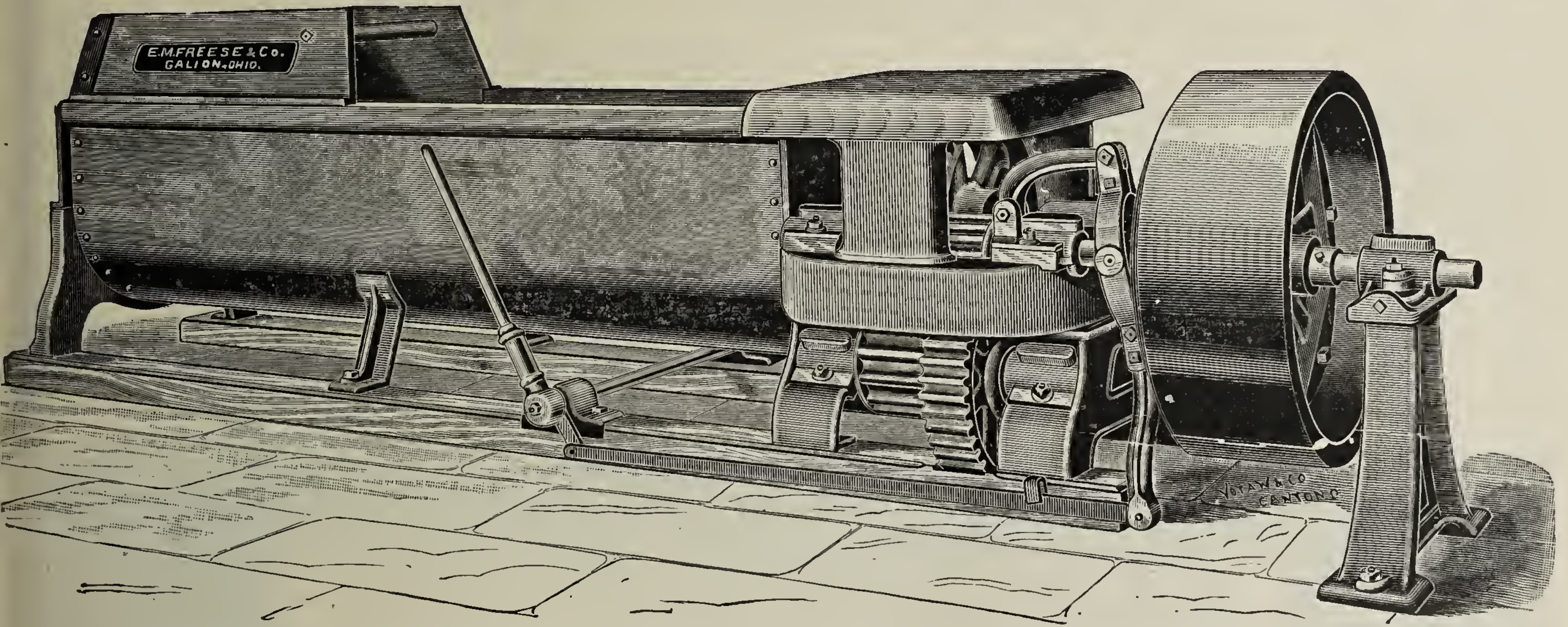
[CONTINUED ON PAGE 66.]

Our Mammoth Brick Machine


BUILT BY
E.M.FREESE & CO.
GALION, OHIO
U.S.A.

THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

Our Pug-Mills Have Features of Great Merit.


E.M.FREESE & Co.
GALION, OHIO.
VOTAW & CO
CANTON O

THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 104 and 105.

EDITORIAL NOTES AND CLIPPINGS—Continued.

the works is in full operation over two hundred men are employed. H. C. Morrow is president and C. B. Stahl secretary of the concern.

One of the big brick kilns of the plant of the Kanne Brick Company East Peoria, Ill., collapsed suddenly, seriously injuring two of the employes, both of whom, however, will recover.

Diltz, Courtney and Dyke have just built a brickmaking plant at Pomeroy, Wash. They will only turn out 10,000 brick daily at the start, but expect to increase their capacity later on.

The Liberty Brick Manufacturing Company has been incorporated to manufacture brick at Liberty, Amite county, Miss. C. C. Bates, L. G. Turnipseed and F. B. Stratton are interested.

The Texas Export Company will build a pottery at Houston, Texas. The company has recently been incorporated with $50,000 capital stock, by S. G. Grimshaw, C. C. Highsmith and T. A. McGregor.

The Coffeyville (Kan.) Pressed Brick and Paving Brick Company has been reorganized and will hereafter be known as the Park Brick Company. G. H. Park, formerly at Beaumont, Texas, is the general manager.

The Ross-Keller Triple Pressure Brick Machine Company, of St. Louis, Mo., has just received an order for a complete four-mold outfit from the Madill Pressed Brick Company, of Madill, I. T. The machine is now being shipped and will be erected and put in operation immediately.

The Milholland Press Brick Company has been incorporated by Lenox Rever, J. W. Milholland, J. J. Woodruff, of Marion, O., and H. Wayman of Dayton, O., with $100,000 capital stock. They will manufacture brick and all kinds of stoneware, and the plant will be located at Marion, Ohio.

Mr. Emil Fernholtz, the patentee of the celebrated Fernholtz dry press, has returned from a five years' stay in Germany and is again installed as superintendent of the Fernholtz plant at St. Louis, Mo.

The Choctaw Brick and Tile Company of Forrest City, Ark., has been chartered. The capital stock is $10,000, all of which has been subscribed. The corporators are Geo. B. Pettus, president; Eugene Willians, secretary and treasurer; J. H. Turley, S. H. Mann, N. B. Nelson, E. A. Rolfe, Otto B. Rollwage, directors.

The entire property of the New England Brick Company was sold at public auction at Cambridge, Mass., recently, for $400,000 to F. R. Hart, representing the committee of the company of bondholders. The operation of the various plants will be continued through the season under the management of the receiver appointed some time ago.

Arthur Koppel, manufacturer of industrial, narrow and standard guage railway materials of 66-68 Broad street, New York, has an exhibition of track, switches, turntables, cars of various styles, etc., at the St. Louis World's Fair. His exhibit will be found in the building of Mining and Metallurgy, block 20, assignment 10, and visitors will receive a cordial welcome.

The Tecloyucan (Mexico) Brick Company has increased the capacity of its plant and can now turn out 60,000 bricks a day. Formerly 25,000 a day was the limit. Over $125,000 has been expended on improvements. Two new brick machines have been installed and a continuous kiln, with a capacity of 30,000 bricks a day, constructed. In addition the company has three ordinary kilns, each with a capacity of 200,000 bricks. It is possible that the company will install a new sand-lime brick plant.

W. N. Alderman, Fred Stalder, Henry O'Bleness and C. H. Doan have purchased the brick plant at Nelsonville, Ohio, formerly owned by James Dew.

Mr. J. H. Reeves has purchased from E. R. Porter his interest in the brick company at Dothan, Ala., and the business is now owned by Crawford & Reeves.

D. H. Applegate & Co., brick manufacturers of Red Bank, N. J., are building a brick plant at Pinebrook, N. J., which they expect to have ready for operation in a very short time.

An attempt was made recently to burn the plant of the New Brittain Brick Company, located at Clayton, Conn., but proved unsuccessful, owing to the prompt and efficient work of the employes. Oil had been poured over the sheds where the fire started. The damage only amounted to a little over $100.

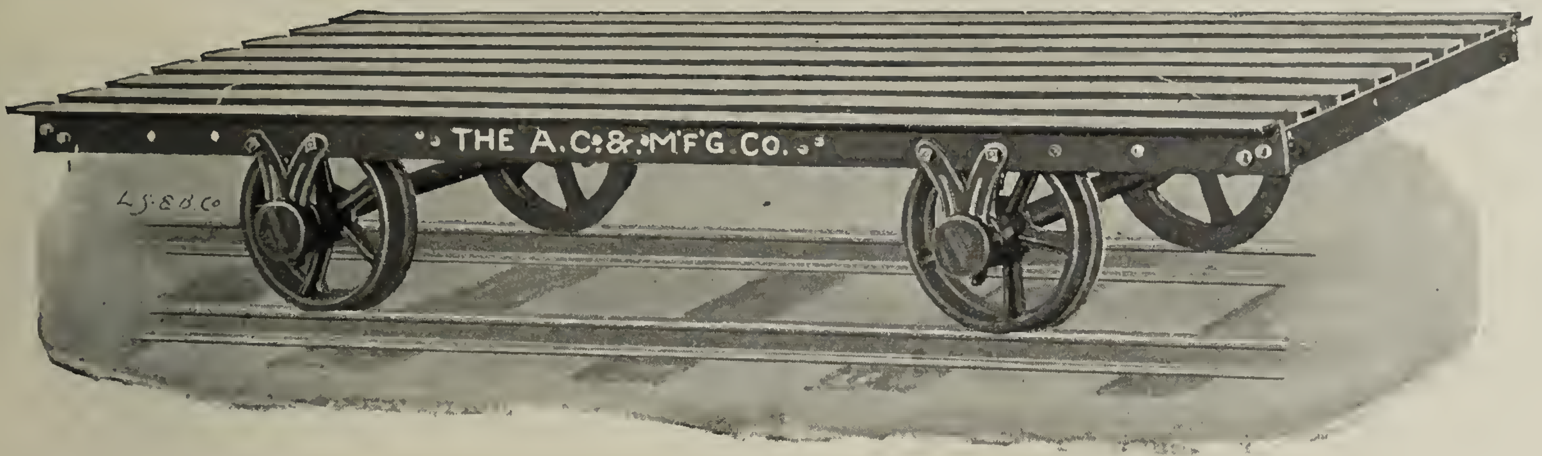
A sand-lime plant has been installed at Daleville, Ind., by the Daleville Pressed Brick Company. They will manufacture under the American system and are very sanguine as to the success of their venture.

The Ross-Keller Triple Pressure Brick Machine Company, of St. Louis, Mo., has just shipped a four-mold triple pressure machine to the Fond du Lac Cement Brick Mfg. Co., Fond du Lac, Wis. This press was purchased after the company's expert had examined all of the dry presses on the market, and after a most exhaustive test. The machine is now en route and will be installed in the course of a few weeks.

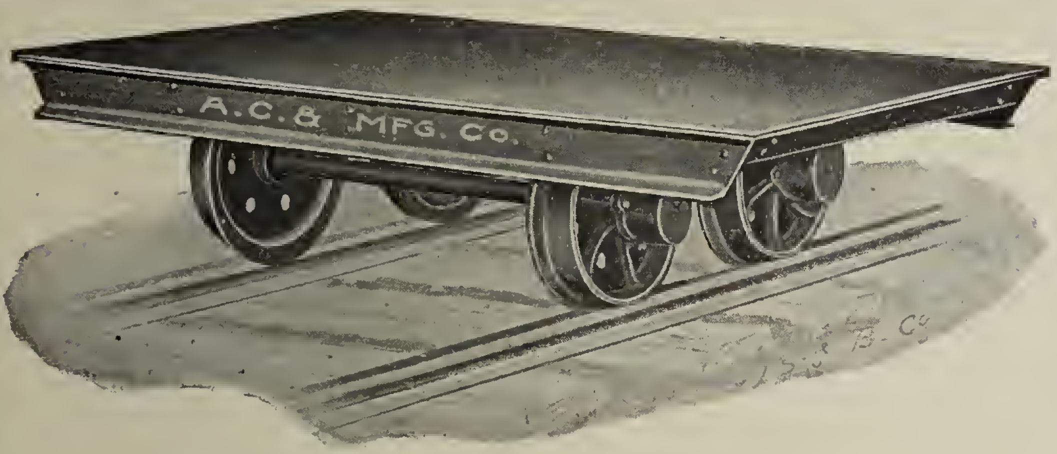
The Stony Brook Slate and Brick Company has been incorporated at Stony Brook, Pa. They will work the slate deposit and make brick out of the shale and waste slate. The capital is $75,000. The incorporators are John W. Minnich and Jacob Ohmit, Wrightsville, and William Isenberg and J. Frank Boyer, Huntington, this State. The plant will be equipped with a full line of machinerv from the shops of Chisholm, Boyd & White, and will be erected under the supervision of S. E. Goldner, York, Pa., who will build six round down-draft kilns of his own design.

A. R. BATLEY,
PITTSBURG, KANSAS.
Practical Clayworker and Designer of Plants.
New sites for the manufacture of brick, sewer pipe, conduits, fireproofing, fire brick, etc., examined and reported upon. Old works remodeled. Clays tested.
REPRESENTING CHAMBERS BROTHERS CO., OF PHILADELPHIA, PA.

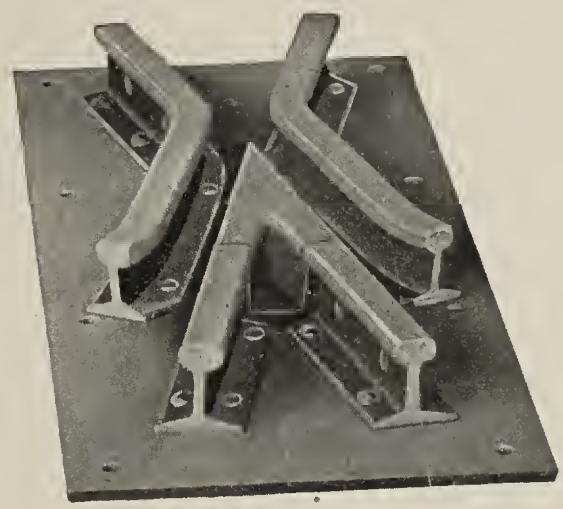
ALPHA CANVAS BELTING.
can be run through water—exposed to heat, steam or varying temperatures, and work satisfactorily. It is long lived under the most adverse conditions. Agencies in all large cities.
THE AMERICAN BELTING CO., YOUNGSTOWN, OHIO.



No. 108. Stiff Mud" Flat Car. Steel Deck.



No. 114. Sand Lime Brick Car. Channel Frame.



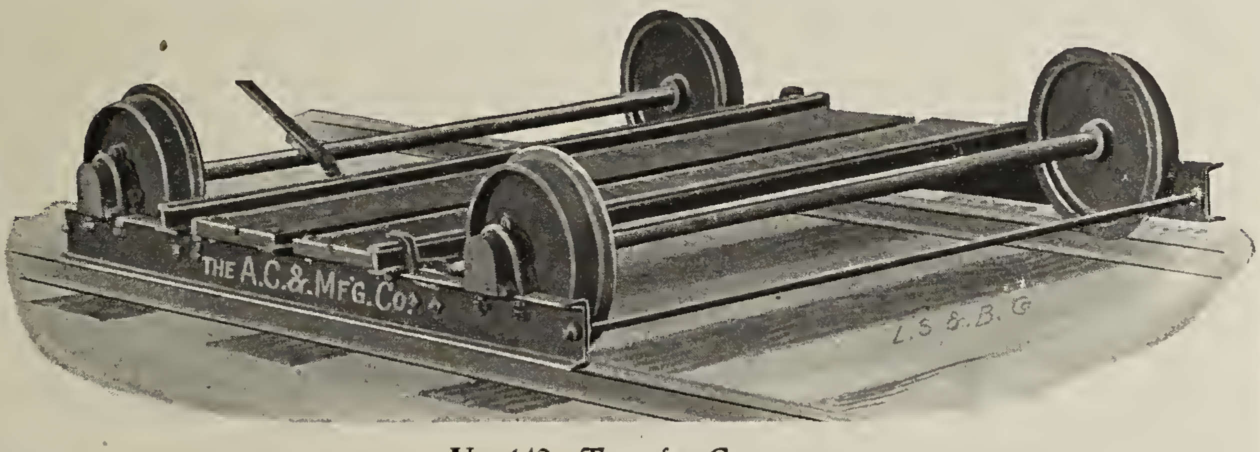
No. 1025. Steel Frog.

The Atlas Car & Mfg. Co.,

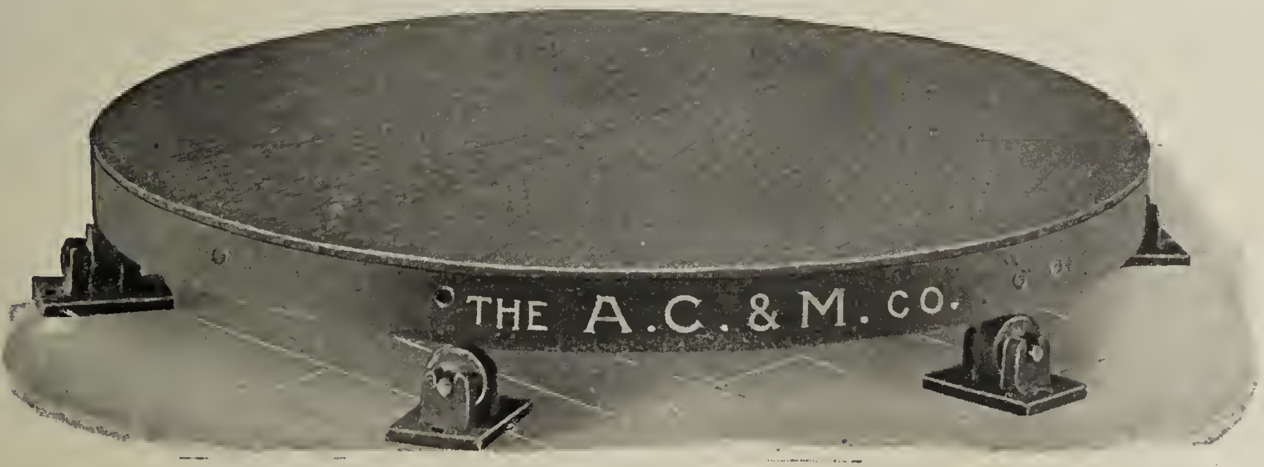
CLEVELAND, OHIO.

Manufacturers of Steel Dryer Cars of all Descriptions and Equipments for Hot Air Dryers, including Rail, Frogs, Switches, Steel Ties, Portable Track, Etc Also Transfer Cars, Turntables, Clay and Dump Cars.

No. A. Flanged Pallet



No. 142. Transfer Car.



No. 147. Checkered Steel Top Turntable.

Written for THE CLAY-WORKER.

NORTHERN OHIO BRICK AND BUILDING NEWS.

ALL THE BRICK PLANTS have been kept running during the past month, although the usual slackness of the summer season has put in appearance. Hard brick had taken a drop of 25 cents per 1,000, common building brick 50 cents on the 1,000 since a month ago, the new prices becoming effective July 1.

"This drop was made to give a little encouragement to the building projects," said William O. Dakin, secretary and treasurer of the Toledo Brick Supply Company. "The slack season will last through July and August, when the fall boom will begin. The yards are now rapidly filling up."

The brick plant at the Toledo Workhouse is running full-blast, and Superintendent Ritter stated that he expects to manufacture 2,000,000 marketable brick this season, which will eclipse all previous years.

Since the city building inspector's office has been decided by the court as having been legally created, the building law is being rigidly enforced. Not so many permits are being taken out at the present time, in view of the slack season now being on, the principal work now being the finishing of buildings begun in the spring. There were, however, a few permits taken out during the past few weeks, which involve the expenditure of a considerable sum of money.

R. A. Bartley, a well-known wholesale grocer, is having a handsome residence erected on Collingwood avenue. The structure will cost $50,000. This was the largest permit taken out during the past four weeks. Bartley's house will contain twenty rooms. It will be constructed of sandstone, with a tile roof. The foundation will be of concrete.

The First National Bank also made an application for a permit, involving the expenditure of $35,000, for the erection of a brick, marble and concrete building on Summit street.

E. H. Depenthal will have a new warehouse erected on Morris street which will cost in the neighborhood of $20,000. The building will be five stories high and will be constructed with concrete and brick. It will be fireproof and will be 100 feet long by 40 feet wide.

Henry P. Streicher will pave Fifth street with Twentieth Century pavers, at a little over $5,000.

The repaving of Dorr street will also be a big job and will be let within a short time.

There are many other streets to be improved and before the season comes to a close there will be close to a half-million dollars' worth of paving let.

Wapakoneta, Ohio, has awarded the contract for the paving of four streets, at a cost of $17,650. Frank S. Mitchell, of Bellefontaine, has the contract.

T. O. D.

Miss, and the World Laughs at You.

A sense of humor does not mean the cheap lucifer-match flash that goes off with a snap and a sizzle leaving behind it a disagreeable sensation of suffocation. One meets that in many advertisements of the "smart" variety not to be imitated. But real humor is of the clean white searchlight variety capable of being turned upon the writer himself and upon his own writings. Be as intentionally funny as you wish to be, but after you have written an ad, better go over it again with this searchlight to see if you have been unintentionally funny. Make men laugh with you and you have made a hit that will help you sell our goods; make them laugh at you and you have made a miss that you will have a hard time living down.

After you have fully finished and polished your ad, read it carefully from every standpoint; apply the "humor test."

This is what the man did not do when he wrote: "Annual sale now on; don't go elsewhere to be cheated; come in here."
—*Pacific Printer.*

Annual Niagara Falls Excursion

VIA

Lake Erie & Western R. R.

Personally Conducted Niagara Falls Excursion in Connection With the

Lake Shore & Michigan Southern Ry.

Thursday, August 4, 1904.

Tickets good returning on C. & B. Line Steamer, Buffalo to Cleveland, if desired. Also

Sandusky and Put-in-Bay.

Side Trips to Toronto, Thousand Islands, Etc.

For tickets, rate, time and pamphlet containing general information, call on ticket agent of the above route, or address H. J. RHEIN,
General Passenger Agent, Indianapolis.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XLII. INDIANAPOLIS, IND., AUGUST, 1904. No. 2.

Written for THE CLAY-WORKER.

THE GATEWAY TO THE NORTHWEST—ITS STREETS AND PAVEMENTS.

By RICHARD A. HASTE.

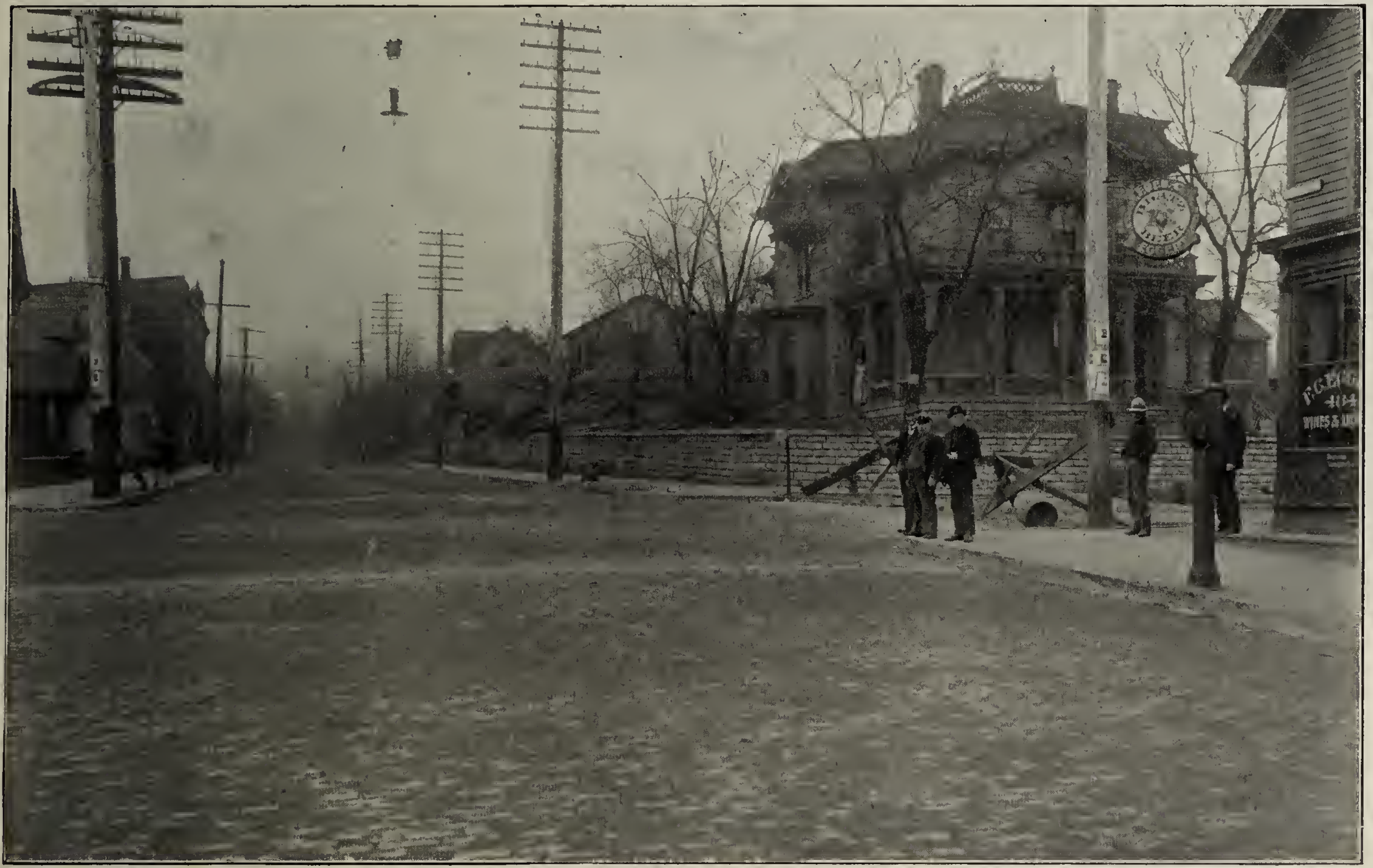
ST. PAUL is a beautiful city. Situated on the Mississippi River five miles below its confluence with the Minnesota, and twelve miles below St. Anthony Falls, at a point where the waters have worn out a mile-wide gorge, this commercial twin of the Northwest occupies a most picturesque location. Here is a modern city with its seven hills and its marble capitol looking down upon a greater Tiber.

The business center of the city lies in an amphitheater, surrounded by a semi-circle of hills fronting on the river. This topography is the basis of the city's most striking feature—its irregular streets. The engineer who sixty years ago laid out the streets of St. Paul knew his business. From the old steamboat landing to the upper bluffs lead a maze of irregular streets—streets with graceful curves—streets which cross each other at most unexpected angles, but always rising to the higher levels with easy grades.

The streets of St. Paul being one of its chief charms, the evolution of the paving problem becomes at once interesting and instructive. For here can be found every possible phase of grade as well as traffic that is encountered in street-making from the country village to the congested commercial metropolis.

A BIT OF PAVING HISTORY.

The history of the paving proposition, proper, in St. Paul, dates from 1882. Although St. Paul, at this time was quite a city, in fact the commercial metropolis of the Northwest, the streets had been maintained in their natural state, barring a few blocks of macadam. Being well drained and having a foundtion of limestone rock, the pressing necessary for artificial pavements did not exist during the city's formative period. The low places and the few quagmires encountered within the original city limits



A Perfectly Smooth Pavement After Five Years' Use—Intersection of Ninth and Roberts Streets, St. Paul, Minn.

were filled with debris from the limestone bluffs and the gravel hills.

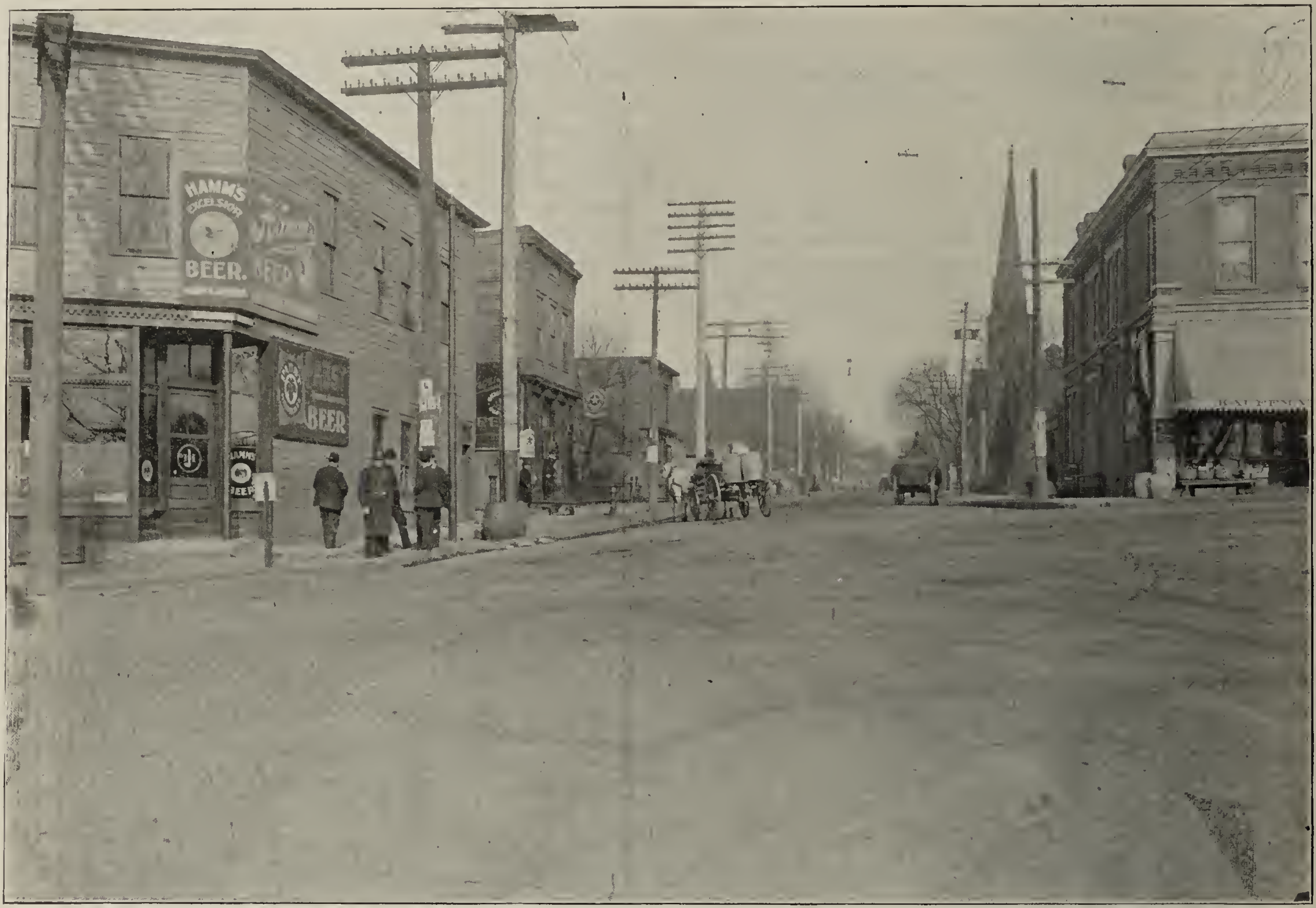
THE PASSING OF WOOD BLOCK PAVEMENT.

The first pavement was laid on Robert street, was of pine block, the Kerr pavement, and cost the city something over $2 per yard. Following this Fourth street and Wabash avenue were paved with cedar blocks, with plank base on sand foundation. This cost the city $1.50 per yard. From that time to 1896 more or less wood pavement was laid but since the latter date wood block has been totally abandoned as a pavement.

The experience with wood pavements in St. Paul has in no way differed from that of other cities. Where the traffic was light it has remained in good shape for about seven years, after that it has been fit only to keep the grass down. There are some streets still covered with blocks laid down twelve years ago, but in the wholesale district where the trucking is heavy the original blocks had to be replaced with granite after less than five years' wear.

No finer pavement exists than well-laid wood blocks when new. For residence streets or where traffic is very light in some respects the wood block pavement has no equal. It affords a sure and easy footing for horses and is almost noiseless. Then, too, in this section, it is cheap. This latter quality appeals to the average property owner, and has always been its chief recommendation. But here the story of its excellence ends. From a sanitary standpoint it is objectionable. As soon as it is a little worn it is difficult to keep clean. Repairs are never satisfactory, and ten years measures the utmost span of its life. After that the whole agony of paving must be gone through again.

The first wood pavements in St. Paul have been replaced by brick, granite, sandstone, and asphalt. About the levee and in certain parts of the wholesale district where the streets are monopolized by heavy traffic, granite blocks have taken the place of cedar. This pavement is laid on a concrete base six inches thick and costs here about $3 per yard. On a sand foundation it is laid for about 50 cents less. In durability there is no pavement superior to granite, but it is the noisiest pavement ever laid and the hardest on horses. The blocks wear smooth and round at the top, so that a granite-paved street after a few years presents a surface of smooth cobble stones over which the heavy draft teams slip and stumble. More than this, and a matter that should be considered in all paving propositions, the loss of power caused by the uneven surface of a well-worn granite pavement is equal to a force sufficient to haul the weight of a given load up a one per cent. grade.



Bradley and East Seventh Streets, St. Paul, Minn. Down Several Years, Subject to Moderately Heavy Traffic. No Perceptible Wear.

ST. PAUL'S EXPERIENCE WITH ASPHALT.

The city of St. Paul, like all other cities, has had its experience with asphalt. At the present time there are twenty-four miles of asphalt pavement. It has taken the place of a large portion of the original wood blocks and has been extensively laid in the residence part of the city. The appearance of an asphalt pavement makes it popular with the general public. But with engineers and others acquainted with the problems of street-making it has a doubtful reputation. In St. Paul it has been extensively tried and found wanting. The pavement has few friends in the engineering department, although contracts are still being let at the instance of the property owners in the residence district.

Two kinds of asphalt covering have been used, the Bermudas and the Lake Trinidad pitch. Both are laid on a six-inch concrete foundation. The first has proved a complete failure. There is no trouble with the foundation—the fault is with the coating. It becomes friable and cracks until the streets look like a war map of Manchuria. Through the cracks the water seeps and the frost lifts the covering from the base.

The asphalt was laid under the usual contract containing a guaranty of ten years with a reserve of fifteen per cent. of the contract price in the city treasury. If the reserve had been fifty per cent. it would scarce cover the outlay in some cases. Hardly a week passes from April to October when the pungent odor of hot asphalt does not fill the air, and when the asphalt gang with its attendant crowd of lookers-on do not interfere with street traffic.

"Why has asphalt failed as a pavement?" I asked of an experienced engineer. "It has not failed," he replied, "but it is being surpassed by better pavements. Asphalt makes a nice pavement, but it has its drawbacks. For instance, it is dusty unless it is kept absolutely clean and constantly sprinkled; it is noisy, too, and will not sustain heavy traffic. I have never seen an asphalt pavement that was not in need of constant repairs after the first few years. Here in St. Paul ,we clean our asphalt pavements by hand and the grades are such that we can flush them at night with ease. But our experience has been unsatisfactory. The cost of repairs is too great and it is a constant nuisance to the public. Yes, the climate may have something to do with it—the weather seems to take the life out of the mixture."

BRICK PAVEMENTS.

The first brick pavement laid in St. Paul was put down on Virginia avenue in 1888. This pavement after sixteen years' wear appears to be in an almost perfect condition. It is somewhat worn, presenting a corrugated surface, but from all appearances it is good for another sixteen years. This pavement at the time it was laid cost the city $2.40 a yard. Even at that price it has proved the cheapest pavement laid at that time.

One fault found with the early brick pavements is that the bricks chip off at the edges, leaving not more than an inch flat surface. While this affords excellent footing for horses, it makes a "hubbly" pavement that is apt to be noisy and disagreeable for carriage traffic. This fault is being remedied by the manufacture of the "paving block" and the use of a firm cement which reduces the chipping to a minimum. There are brick pavements in the city which have been down five years and show a surface almost as smooth as asphalt.

The evolution of the brick paving-block would serve as a subject for a separate article. It is owing to this steady improvement in material that the brick pavement is so rapidly coming to the front. If the old brick, laid, as they often were, indifferently, last so well, what may not be expected of the modern paving-block laid on a concrete foundation in the best Portland cement.

Since 1896 there have been laid in St. Paul, about seven miles of brick pavement beside gutters paved with brick which flank many asphalt and sandstone paved streets.

A Brick Paved Residence and Business Thoroughfare That Will Evidently Remain in First-Class Condition Another Decade or Two.

It has been found that asphalt is not adapted to grades. Streets thus paved become absolutely useless whenever there is a coating of ice. Even when wet they are dangerous. Brick and sandstone, therefore, have been used on all steeper grades in the city, In some cases the center is of brick or sandstone and the sides of asphalt—in every such case the center is in perfect condition while the asphalt with little use needs constant repair.

The only serious rival that brick has in the estimation of the paving experts in the locality of the Twin Cities is sandstone. This particular sandstone from the quarries of Kettle River, Minn., seventy miles distant, can be laid on a concrete base for $2.50 per yard, and on sand for 50 cents less. It wears smooth. but leaves a grit which prevents slipping. Considered in every respect it is the nearest approach to a well laid brick pavement that has yet been tried. It costs more. Whether it will last longer is yet to be determined. For heavy traffic it is a more satisfactory pavement than granite. It is used extensively on heavy grades because of its smoothness and the excellent footing it affords. But in my investigations I have found no place paved with sandstone where paving brick would not have done just as well and supplied every possible demand—and the cost would have been less.

One fact worthy of note is that all the bridges and viaducts in and about St. Paul are paved with brick. The same is true of the heavy fills such as are found on East Seventh street.

As the imperfections of other materials are demonstrated by time, the brick is coming to be appreciated. The further fact that improvements in brick construction and adaptation are constantly going on, points to this material as the coming pavement for all-round purposes.

The advantages of brick are its durability; its freedom from dust; its non-absorbent qualities; the perfect footing it affords to horses; and lastly its appearance, for there is no finer looking pavement than one of well-laid brick. The bit of color that it adds to the green of the lawns and boulevards is a pleasing relief.

Up-Grade on Summit Ave., St. Paul. A Smooth Pavement, yet Horses Seldom Slip on It.

The brick used in St. Paul pavements comes mostly from Galesburg, Ill,, and from DesMoines, Iowa. The brick that is being laid now in the open space about the "Market" bears the "Purington" stamp. This brick block is manufactured by The Purington Paving Brick Company ,of Galesburg. The present cost of brick pavement is about $1.80 per yard.

USE OF MACADAM.

A word or two about the use of macadam on the streets of St. Paul. Limestone being abundant—so abundant that it could be had for the taking—a plan was devised to macadam certain streets. Smith and Pleasant avenues were taken for this experiment, and a more disastrous experiment was never perpetrated on the innocent inhabitants of any street. The limestone pulverizes under the traffic to a fine white powder, which when the street is allowed to get dry flies in clouds before the slightest wind. On the other hand, when the streets are wet from a rain or even by a street sprinkler, a fine coating of mortar covers the entire street from curb to curb. Attempts have been made to remedy this with a coating of crushed slate, but it served only to change the color of the dust and mud. I mention this experience for the benefit of those who think of using limestone or slate as a top dressing for streets.

St. Paul has at the present writing nearly forty-eight miles of pavement other than wood. It is divided as follows: Asphalt, 24 miles; brick, 8 miles; sandstone, 5 miles; granite, 1 mile; the rest mixed. All but a small portion of the brick pavement has been laid within the last six years.

AN ERA OF ORGANIZATION.

This is an era of organization in the building world. Taking their key from the success of the labor unions, employers throughout the country are now devoting their best energies to amalgamating themselves into associations for the protection of their own interests. There is a wave of organization sweeping over the country, which has found expression in citizens' alliances, industrial associations and employers' central bodies, which are being established in almost every city of any consequence. The organization of these movements is to be found in the unjust and in some cases harassing demands made by the labor organizations in the last two or three years, covering the period of unusual prosperity. It is a well known fact that with the scarcity of skilled labor come many unreasonable exactions on the part of labor unions. These demands are complacently met for a time, but naturally employers feel that there is a limit beyond which they cannot go in justice to their business and the making of a reasonable profit as the fruit of their industry and the use of their capital. In both Chicago and New York the building contractors have organized into compact associations, which have met with considerable success in clearing the atmosphere for the coming year, assuring greater peace and harmony than has heretofore existed. Similar associations are being organized in Pittsburg, Baltimore, Washington, and in many other cities throughout the country. In all of these movements the promoters declare themselves as not opposed to the spirit of organization among their men, but rather to abuses that have been allowed to exist in the building trades for the want of intelligent co-operation among the employers. This general agitation has brought the contracting builders into closer harmony of action than ever before, and is a healthy sign of the times, giving promises of better things during the year. With a lessening of strikes, lockouts, and the many other hindrances to the progress of building operations, capital will be assured of desired progress in undertakings, and it is hoped that in this way a check will be placed on the diminishing volume of building operations throughout the country.—*Ohio Architect and Builder.*

Fifth Ave., St. Paul, Paved in the Center with Brick, and at the Sides with Asphalt.

Written for The Clay-Worker.

THEORY OF DRAFT AND CHIMNEYS—No. 5.

By Theo. Rizer.

THE SQUARE CHIMNEYS with the side of the base one-tenth the height and a batter of one-quarter inch to each foot of height has been so many years the brickyard standard, that it would seem almost heretical to advocate the use of any other form. Yet we might with advantage build the chimney either octagonal or star-shaped in cross-section, some of the tallest and best constructed chimneys of the world being star-shaped on the outside perimeter. The perimeter is usually eight-pointed in outline, being the form obtained by the projecting corners of two overlapping squares, the diagonals of one coinciding with the diameter of the other. Chimneys of this form are well adapted to resist the overturning tendency of the wind, and present a fine external appearance where the star points die away or merge into a neat corbel or bell cap.

But for safety, economy and neat appearance, no other form of chimney can equal the circular shaft. This form of chimney should, therefore, appeal strongly to three classes of brickmakers—first, the cautious; second, the economical, and, thirdly, but not least, the esthetic brickmaker.

The greater stability of the round chimney over its orthodox rival, the square stack, may best be illustrated by a comparison. The two stacks under consideration were each 100 feet in height and of approximately equal capacities, and were used in connection with continuous kilns of the Guthrie type.

The square chimney measure outside the brickwork was 12 feet 6 inches square at the base, and 10 feet 6 inches at the summit. The inside measurements were 8 feet and 7 feet 6 inches respectively. The circular shaft was 13 feet 6 inches, outside diameter, at the base, and 11 feet 6 inches at the summit, the internal dimensions being 9 feet and 8 feet 6 inches respectively.

The formula giving the force necessary to overturn any square chimney was given in the fourth article of this series as $P=\frac{Wb}{h^2d}$. With the two chimneys under consideration, the following values may be assigned to the letters of this formula:

	Square.	Round.
W	1,000,000	820,000
b.	12½	13½
h.	100	100
d.	10½	11½

Therefore, for the square chimney the wind force which would be necessary to overturn it is $P=120$ pounds per square foot; while a similar calculation for the round chimney gives $P=96$ pounds per square foot. However, it has been demonstrated, experimentally and mathematically, that the pressure exerted on a cylindrical surface by the wind at a given pressure is only one-half that exerted on a plane surface of similar extension. It is therefore seen that the wind pressure necessary to overturn the round shaft is $96\times2=192$ pounds per square foot. Consequently, the latter is lighter, safer in storms, and, as a matter of fact, will pass more hot gases through it under similar conditions than the square chimney. The foregoing should vindicate the cautious brickmaker for his choice of the round shaft.

As a justification of his course in selecting the round chimney in preference to the square form, the economical manufacturer might point to the fact that of the two chimneys we are discussing, the square shaft contained approximately 180,000 brick above the ground level, while the round chimney contained something less than 150,000. Consequently, it is readily supposable that but few would prefer the square chimney, if they had once studied the question.

To the esthetic brickmaker we will leave his own defense, secure in the knowledge that curvilinear forms are almost universally conceded to be the most beautiful in the world of nature and of art.

The thickness of the brickwork in the chimney will depend to a great extent on its height; and the crushing strength of the material must be considered as well as the overturning action of the wind. The permissible bearing strength of brickwork laid in lime mortar is usually taken at 100 pounds per square inch. The thickness of the brickwork at the top of brick stacks 100 feet in height must not be less than 13 inches; that is, a brick length and a half for a distance of twenty feet from the top downwards, as this portion of the chimney suffers most from exposure and the deleterious action of the gases resulting from combustion. At twenty-five feet from the top this thickness should be increased 4½ inches, or two brick lengths, and it is good practice to continue thereafter this increase of 4½ inches in thickness for each twenty feet measured downwards.

A fire brick lining for nearly or quite the full height is an essential component of a chimney creating draft for kilns, as the exceedingly high temperature of the gases from a kiln in full heat would soon cause the destruction of common brick. Where the heat is comparatively low, as is the case with the ordinary boiler plant, the fire brick lining need extend only twenty-five feet or so in height, depending on the height of the stack.

If an air space of 1½ to 3 inches is provided between the lining and the main wall of the stack, the unsightly and injurious cracks due to the unequal expansion of the wall from the heat will be largely avoided. This space is usually closed at the top by a sealing course of brick to prevent soot and obstructions from falling between the lining and the wall. However, if the chimney is tapered and the lining built straight, the air space will run to a close at the top; but, in no case must the fire brick lining be attached to the brick work of the main wall. This is imperative, in order that they shall be entirely free to expand separately.

The openings at the case of the stack for flues and to permit of access to the interior of the stack, must be carefully built and provided with well-constructed inserted arches which will transmit the pressure or weight of the wall to the foundations. The sides, bottom and top of these openings should be lined with fire brick and the inside edges of the flues rounded.

The openings left for clean-outs are frequently provided with suitable cast-iron doors and frames, but ordinarily they may be sealed by a brick falsework built carefully to avoid air leakage. This falsework is readily removed and replaced when it is necessary to clean out or inspect the interior of the stack. If iron doors for this purpose are used, they must be hinged or otherwise arranged so that they may be conveniently open and securely closed.

The size, shape and number of such openings is optional; but in any case, it is necessary to make them large enough to admit a man.

A terra cotta cast-iron or stone cap, if properly designed, will afford good protection for the top of the stack. For large stacks these will necessarily be made in sections, and care must be exercised that the sections are securely fastened in place, as a displacement and fall of one of them might result in considerable damage. Cast-iron caps have the sections provided with flanges, so located that they can readily be bolted together when set in place. Probably the chief objection to cast-iron for chimney tops is the discoloration caused by the rust uniting with the moisture and running down the brickwork. This objection, however, is not considered a serious drawback, as the top of the stack is usually well smoked, any way.

The vertical joints between the sections of stone or terra cotta caps must be so arranged as to exclude moisture, thus preventing the danger of displacement by freezing.

Blue sandstone carefully selected, will probably be the most durable of cap stones. The use of limestone for caps should be avoided, as it is especially subject to the action of the sulphur in the gases. Granite may be used successfully where the heat is low, but is liable to be split with high temperatures, especially when cooled suddenly by a dashing rain or otherwise. Whatever material the cap is composed of, an ample overhang should be allowed, and of such form that it will shed and drop the rain clear of the stack.

Another feature of chimney construction that is usually neglected in brickyard practice, is the protection of tall chimneys by lightning rods. This point cannot be too strongly advised, as it has been definitely ascertained that structures of greater height than their surroundings are particularly susceptible to damage by lightning. The destructive effect of the stroke may be greatly lessened by the use of well-grounded and properly constructed rods.

(THE END.)

Written for THE CLAY-WORKER.

ATLANTIC CITY'S NEW ATTRACTION.

How the Sand Lime Brick Plant of the H. Hunnekes Co. and Its Product Impressed an Old Time Clay-Worker Scribe.

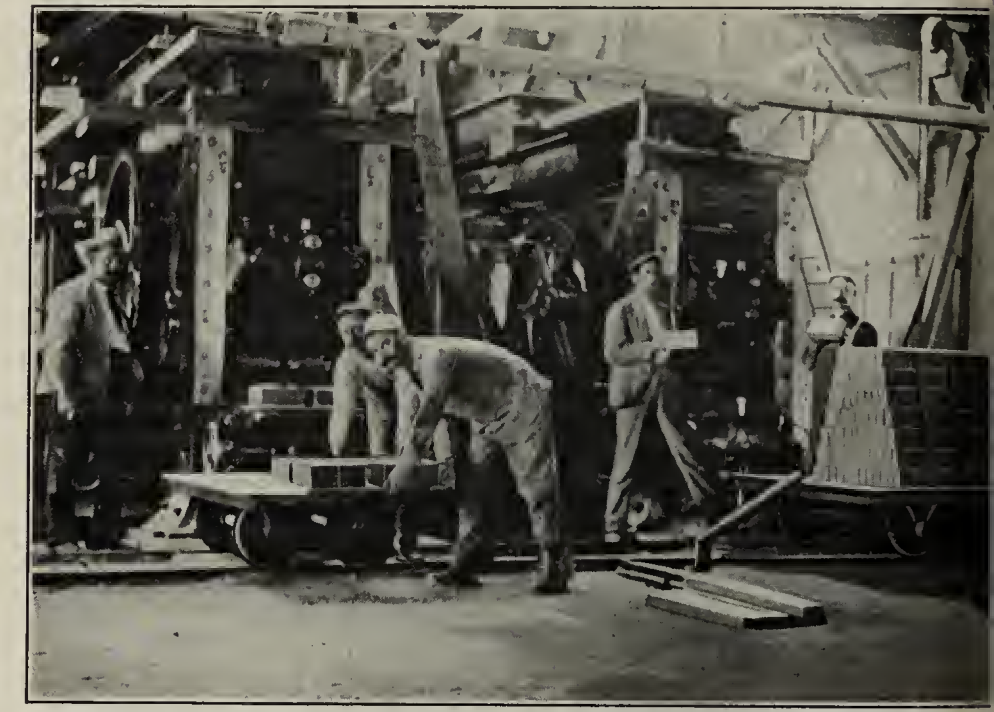
WHILE SOJOURNING at Atlantic City during May and June this season, I was made wise to the fact that old "Father Neptune" had at last been made to pay tribute to Cæsar of the brick industry, and had given material aid with his lovely shores and beaches to the composer of strange brick, with a result of lovely structures compounded in the natural, and every other color that man could desire, and all from sea-sand. This to me was a revelation. Sand brick, Yes. I was up on that; but sea-sand; the pure washings up of old Father Neptune; well, it was new to me, and although ingrained as a clay brick faithful son, I had to look, to investigate, to admire, and eventually to pay full and sincere reverence. On this favored strip of sea sand where the charming city has its being, no clay exists, but this genius of man and his machinery has taken up the exhaustless treasure of a beautiful material and it is being converted into buildings ranging from the humble to the most ornate, that must, eventually, convert the city into a solid one, fairly free from the ravages of the fire fiend, by the use of material that will resist the flame.

Atlantic City is packed side and side with frame hotels. Their number is legion, and by a careless spark or a carelessly thrown cigar or cigarette stump, while yet burning, into some inflammable material, and with a stiff wind blowing, this beautiful city would soon be in ashes. This state of affairs is beyond successful disproof. All hail the sea-sand brick (in the absence of the clay brick), and it occurred to me when investigating the manufacture of sand brick here and noting the buildings constructed of the material, that an article on the manufacture of it might not be amiss for our esteemed CLAY-WORKER.

I found that the H. Hunnekes Company was the party running a manufacturing plant to work sea-sand into brick. The factory is located on a fine bay that forms an inlet from the Atlantic Ocean and lies to a parallel with it about a mile back on Morris avenue; in fact, it is a part of the city proper. The plant is managed by certainly most courteous gentlemen, not given to reticence when one wants to extract facts about the company's business, and information to the journalist. Mr. D. W. Cummings, the superintendent, most courteously showed me over the plant and fully explained the entire method of processing the sea-sand into commercial brick, *i. e.*, as far as the methods and patents, etc., might be explained publicly. The factory is an extensive one, and on my visit was being extended, and new accessions placed, that the demand for a larger output might be met successfully. The product is in popular favor, and the company has not been able, even with large facilities, to keep up with the demand for material.

The factory is equipped with Chisholm, Boyd and White presses (3), and the manager reports entire satisfaction with their operation on *sand*. I had it in mind that the sand would soon grind out the dies in the presses, but now, after over a year's use, they, the original dies, are yet all to the good. Questioning the manager, Mr. H. O. Keener, as to the brick being tough and tenacious as compared with clay, he assured me that when the sand brick were thirty days from the press, they would stand a pressure of 3,500 pounds per square inch. The tensile strain I did not learn.

The process of converting "sand" into brick by the lime, cement, and allied methods, is so well known and understood that it is not for me to enter into the technique of the matter (some of the processes being patented), but as a matter of economics in building, it is all and in every way important. Here we have a process that commands every method of economy and cheapness, allied by quick product, that should result in nature's soundest material being put into the primary form for cheap and durable homes for the million, *i. e.*, as against inflammable wood, and all that it implies for non-endurance. Here we find safety, at least on a low price basis for homes, if the manufacturers do not overreach themselves by extravagant premiums on patent rights. Now, why should they? Now, here is nature's raw material, and in inexhaustible supply. The process does not limit the manufacturer to the orthodox brick in size and form, for it can be made by special moulding and special moulds to an indefinite number of forms, and the sand can have ingrained into it all the colors that go to please the eye, and conforms not only to esthetic taste, but also lends itself to ornate design and architecture of the most elaborate kind. The Atlantic Company has bent its resources to all of these conditions and presumable requirements, hence my interest, and this screed.



Loading Freshly Made Sand-Lime Brick on Cars Just as They Come from the Press.

As the editor of THE CLAY-WORKER knows, the writer saw the clay brick industry rise from the "mud pit" to the "hydraulic" and mechanical pressure machine mold to the acme of the dry clay process, and naturally he would be, and is, strong on clay. But Nature gave us a second material, viz., sand, and why not utilize it as an adjunct and a twin brother of clay? Clay and sand are the right and left hand of the real brick manufacturer. Why should the trade with these two grand elements at hand and command not be ambidextrous as to business, and for profit corral both, for with suitable "presses" it is proved that they can work both materials.

There is a crying necessity for a building material, that, as laid up, will come at lower rates than lumber and clay bricks, a material that will by its low cost give the average grade of workman a chance to build a home and own it.

This ocean sand at the ocean side solves the problem locally, if (I wrote "If") the patent owners will only come down to a price below the cost of lumber now so swiftly vanishing from our country.

The sea-sand, in fact any deposit of sand, costs as primary material next to nothing, and in connection with the low cost and ease of manufacturing into building material, should induce manufacturers of it to open a new era of building cheap, good, enduring, and very attractive homes for the common people. If not, why not?

Greed, of course, dominates almost all of our modern commercial deals and transactions, but cheap, good homes, since the days of plentiful timber and cheap lumber, does not seem to attract builders. In sand we have a mine of wealth and universal homes. Why not be up with the requirements of the people's needs, and "get down to business with sand," for here on the coast it is cheaper than dirt, and do as this most excellent company of sand brickers at Atlantic City is doing, *i. e.,* turn out a material that answers every requirement for buildings from the humble cottage to the most elaborate palace.

The processes used by the Huennekes Company shows not only beautiful brick as to form, close grain, perfect edges and angles, but any color desired can be infused into the product, and "there you are." Up to date the clay brick manufacturers have not met the demand for popular homes for the mass of our people. Will sand solve the problem? They are on the substratum of cost where sand is available, and it is up to them to do the grand act as "home builders." If not, why not? Later, I hope, Mr. Editor, to go fully into details as to cost of production of sand brick, and cost of one and two-story cottages by the seaside, and the wayside, for the homes of the masses.

DANIEL E. RYAN.

A Seashore Sand-Lime Brick Plant.

The brickyard near Waynesville, Ga., for many years operated by the late Captain William Crovatt, and which was recently purchased by J. A. Montgomery, has been thoroughly overhauled during the past few months and is now one of the best equipped brick yards in the South. All the old machinery has been replaced by new and modern machinery and equipment for the manufacture and handling of brick and there is now being manufactured at this plant a brick far superior to the average brick.

SETTING OF TERRA COTTA FIREPROOFING.

NO MATTER HOW complicated may be the setting of a piece of terra cotta, nor how necessary it may be to fit terra cotta fireproofing for a certain place in a way which might best be appreciated by those who designed it, it is nevertheless impossible to have this work done under the immediate direction of the manufacturers who are most interested in having it done right. The result is constant vexation and disappointment to every architect and manufacturer who know how well terra cotta may be set by experienced hands. The recent strike of the bricklayers in New York virtually hinged upon this question. The terra cotta manufacturers from the very first have insisted that their specially trained men are most competent to handle their material; but between the subcontractor, who has only a reflected obligation to architect and owner, and the labor unions, who in their blind conceit are bound to conquer or destroy the labor market, the terra cotta manufacturer and the building itself generally suffer. If the time should come when the owner, who is the one, after all, who pays the bills, will have the courage to take a determined stand and insist upon his work being done by trained men, or if the labor unions could by some wise dispensation of providence come under the sway of capable men, there would be hope that we might have this very important portion of the work done as it should be. The terra cotta manufacturers want it, and it is not in any sense a question of cost. It is merely a blind, unreasoning prejudice on the part of the unions, which results in a loss to every one concerned—the owner, the architect, the builder, the mechanic himself, and, as has been often shown by our large fires, the insurance companies are also sufferers by this mediæval rule.

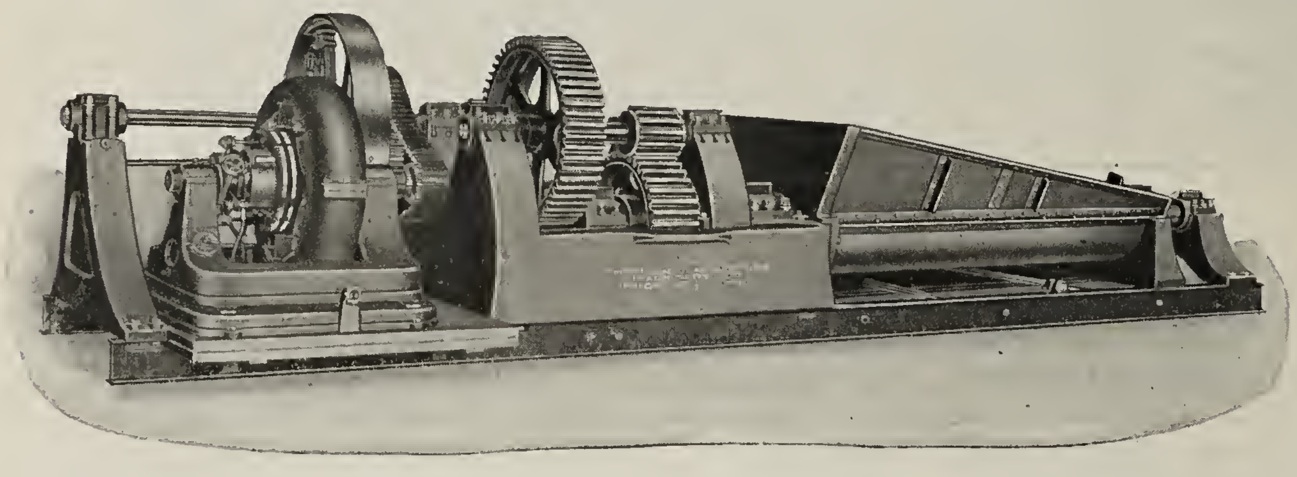
There was a time when terra cotta was the only fireproofing material in general use. During the past decade, and more especially the latter part of it, the patented systems of reinforced concrete have been studied very thoroughly by engineers, and a great deal has been made of them. The weak point in terra cotta fireproofing is the setting, never the material itself. And yet every now and then a fire reveals careless setting and indifferent filling of joints, which the constructor and the superintendent thoroughly deplore, which every fireproofing company knows full well how to avoid, but which with the existing sentiment of the bricklayers really cannot be avoided. The bricklayers are very short-sighted if they cannot reason it out that it is more to their own selfish interests to have terra cotta used and used rightly than it is to have our contractors turn for relief from the poor setting to a use of concrete, in which they can employ trained labor.—*The Brick Builder.*

ELECTRICALLY DRIVEN MACHINERY FOR CLAY-WORKERS.

"IT is gratifying to note that in the midst of labor troubles the foremost labor leaders and union men have come to the conclusion that labor saving machinery and devices are a source of bettering their conditions and furnishes employment to a greater number of men than the old hand practice. They realize that machinery with its wonderful output has made the purchasing power of their wages several times greater than it was during the "hand made" period and that it would be foolish for men to spend money in building one of our modern ocean liners, requiring 30,000 horse-power to drive it, if it was to be driven by hand-power because it would require 180,000 men to do the work of the 30,000 horse-power engine. This number of men crowded into a boat would leave no room for passengers. This rule will apply to our fast running trains and everything else. If it were not for the improved machinery we might be sucking our soup from an earthen jar with a quill, and using flour ground with stones as the Pueblo Indians are doing today.

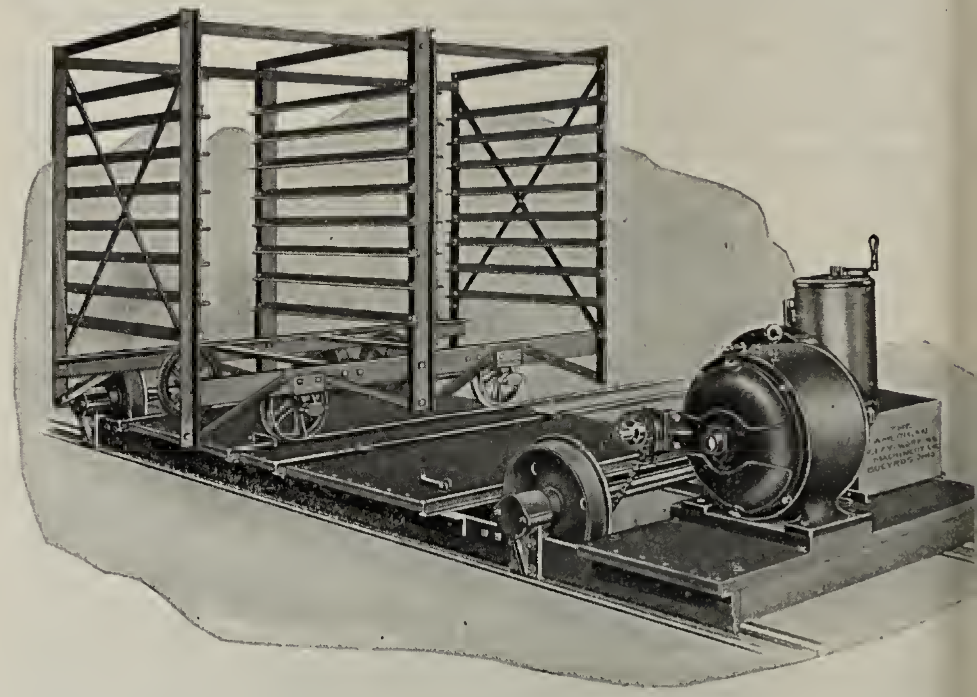
The hand brickmaker is largely responsible for the rapid advancement made by the structural steel manufacturers in furnishing material for modern building, because they insisted on sticking to the primitive way of making brick and were slow to accept improved methods and machinery to meet the wonderful demand of our rapid growth.

It is pleasing to note that the modern up-to-date clay building material manufacturers with improved machinery are making rapid progress toward meeting the demand of builders for clay material that meets the requirements of modern building construction. It will be interesting for the clayworker to go back twenty years and see what was offered in the way of clayworking machinery at that time. They will find that the machinery was crudely built and too light for the work required of it. Instead of hand made we had advanced to hand cut. The next step was automatic cutters to meet the increased output of the machine. Twenty years ago 25,000 to 30,000 brick per day seemed to be the limit of machine capacity, now 100,000 to 150,000 and even 200,000 per day is quite a common output. The hollow building block was in its infancy, and only a few shapes and sizes were made in limited quantities.



Electrical Driven Clay Granulator, Built by The American Clay-Working Machinery Co.

Today we have special machines of large capacity for making hollow blocks. Shapes and sizes cut no figure, the shape and size are made to suit the builder. In looking over the file of the trade journals for the past twenty years you will notice advancement made by the machine men to meet the rapidly growing trade. It will also be noted that none have made more improvement in clayworking machinery particularly in the last five or six years, than The American Clay-Working Machinery Company. Compare their 1904 catalogues with ones formerly issued by them and you will be convinced that all branches of the clay machinery line have been improved by them. With this article you will see their electrical driven line of machinery. Compare their weight with the weights of machines built in the past and you can not help but see the vast improvement being made by them in this line. The increased demand for capacity called for increased weight, increased strength and higher grade workmanship in the manufacture of their machinery. Conditions are not always such in designing a clay plant that the machinery can be placed in line with a driving line shaft to get the best results. To meet these requirements and to be able to place a machine most conveniently and advantageously in a plant, they have designed a line of electric driven machines, thus bringing their line right up to date according to the very latest "shop practice." Taste has not been lost sight of as progressive men, willing to invest their money today in the manufacturing lines, are not satisfied with unsightly designing. They recognize that lines of beauty symmetrically arranged give high order to their plant and is an incentive to raise the standing of their workmen, who seeing the employers buying beautifully designed machinery, take a pride in keeping it clean and in good repair, and producing from it the highest grade of clay product that can be made. The American Company not only studies the question of capacity, but they break away, so far as practical, from the primitive way of making clay products, and the crude, stultified designs of machine construction. It is their aim to furnish the trade with machinery that is a "thing of beauty" as well as strength and high grade workmanship.



Electrical Driven Transfer Car, Built by The American Clay-Working Machinery Company, Bucyrus, Ohio.

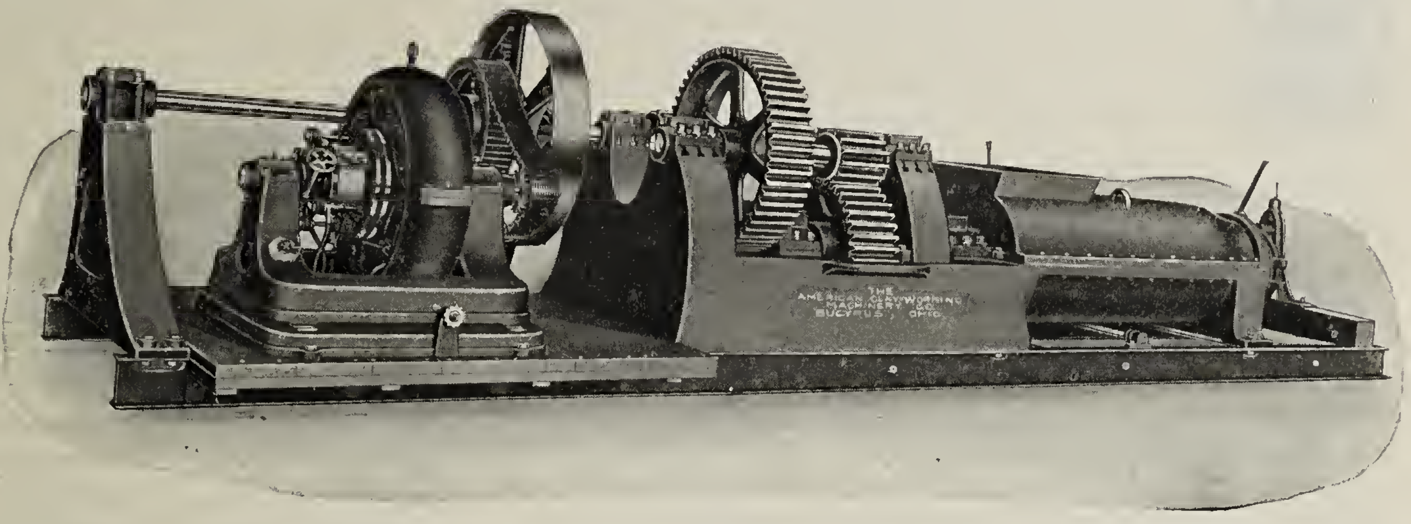
The new catalogue of The American Company shows practically every machine and appliance used in the manufacture of every class of clay products.

Don't let good machinery that has been discarded rust out in the scrap pile. Put a card in THE CLAY-WORKER'S "For Sale" columns and find a purchaser.

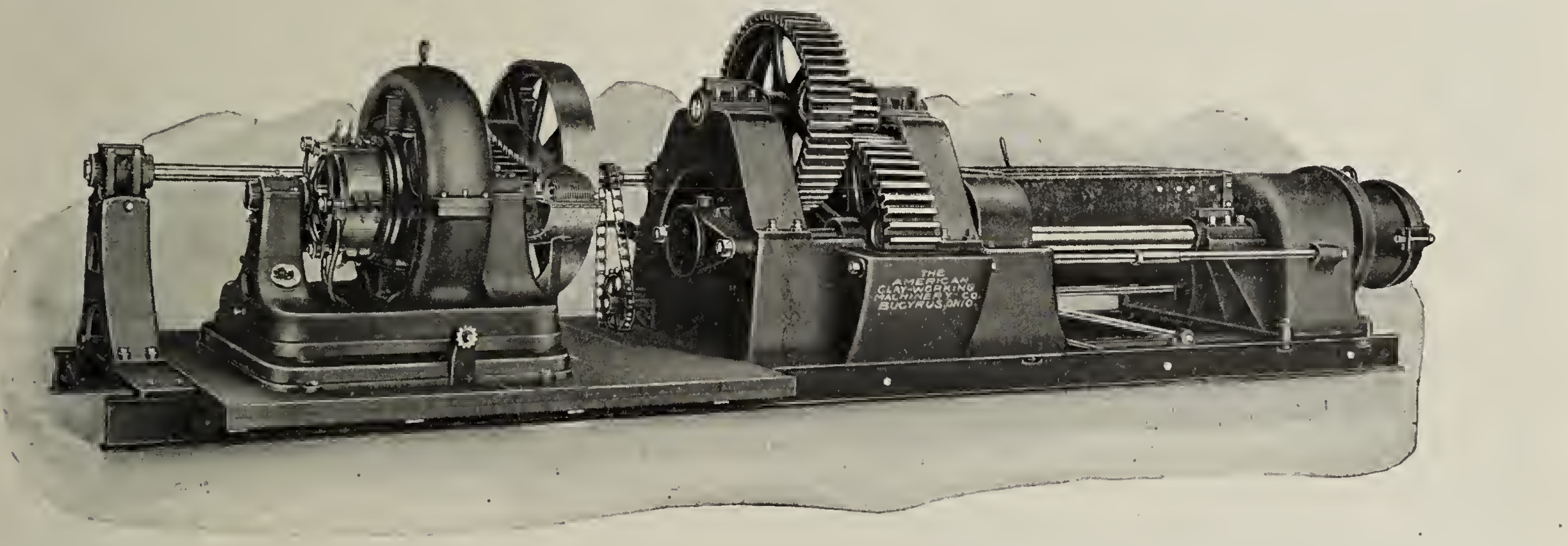
Written for The Clay-Worker.

THE CAUSE OF CRAZING SEWER PIPE—HOW TO STOP THE TROUBLE.

THE CAUSE OF crazed pipe is careless firing. That is the charge I make against the kiln fireman, when they do not do their duty, but draw their wages from a company, which has to suffer the loss and yet is made to believe that the mixture of the clay is not what it ought to be, and still some kilns come all right with the same stuff. Crazed pipe is the result when they are set green and when the fires are burning too rapidly and the draft is too strong. The skin or outer portion of the pipe drys too fast, it becomes hard, and confines the moisture (added in tempering the clay). The skin of the pipe being hard and the pores closed, prevents the heat from penetrating the inner portion of the body of the pipe; the moisture is not evaporated, it is confined, and finally becomes hot enough after much delay to boil, and in order to get out, it breaks the shell of the egg, and, of course, not the whole shell of the egg, or not the whole shell of the pipe breaks off from the inner lining, but it bursts in places, up and down, crossways and every way, and through those cracks the moisture escapes, and the cracks, only 1-100 part of an inch or less, do not close any more, and we have a crazed pipe, or, maybe, a whole kiln full. Now, the remedy for this trouble, when the pipes are set green, is this: Have your water smoking done very slowly; if the draft is too strong, lower the damper to reduce the draft, so you will not have much blaze, but more smoke. A fire like that makes all the heat necessary to dry the pipes safely. Then, when you consider the pipes in the kiln dry (which they are at 150 C.), you can raise your damper, not too much, and proceed to heat up the kiln, and all will be well, provided you will not blow the pipes afterward.



Electrical Driven Double Shaft Pug Mill, Built by The American Clay-Working Machinery Company.



Electrical Driven Low Frame Combined Machine, Manufactured by the American Clay-Working Machinery Co.

The next stage in the burn, when pipes are crazing, is in the heating up, and it happens more often when using slanting gratebars. In heating up a kiln, care must be taken not to allow any air to enter under the coal Bituminous coal generally cakes and hangs on top and gets hollow underneath; the cold air chills the bags and also the bags in the kiln, then, when firing up again, the chilled pipes are not in proper condition to stand the sudden increase of heat, and firecracks, very similar to crazing, occur. It is not the crazing occurring as mentioned before, as the crazing is much deeper and more damaging to the value of the pipes. In the first stage, they ring good and pass as firsts on some orders, but in the latter stage, the metallic ring is much more affected and they cannot be sold, except for seconds, and seconds are not worth handling. Second-class sewer pipe only pays when it is sold from the first-class hack.

The remedy for this kind of crazing as described, is this: After firing up and when the smoke clears away, go around the heating-up kilns, and if the coal hangs on top of the gratebars, take a poker (iron rod) and push it down from the top on each side and middle and shake the coal a little, so it will slide down the grate-bars and so keep the air out. That will remedy the trouble.

At another time, pipes craze or, rather, firecheck. Crazing in this case is not the proper expression, firechecking answers the meaning of the word better. It occurs when clinkering the fires before the pipes are really red-hot. A strong coal makes a lot of clinkers and ashes. Both accumulate so that when they are removed barely a handful of fire is left to put the coal on, and so much cold air enters the fireholes and checks the pipes nearest to the bags, so that sometimes they split wide open. There is a remedy for this: Before clinkering, fire the holes you intend to clean very, very heavy, let them burn until the smoke clears off, then drop the damper until the fires draw back, then raise the damper enough to let the fires draw in, and proceed to clean out the clinkers, and if the fires should get too low, the cold air will not have enough power to crack your pipes; the reduced draft keeps the cold air out. After clinkering, give the kiln as much draft as necessary to consume your coal and have combustion. In fact, at every clinkering the draft should be shut off enough to keep the air out. Thousands of dollars are lost every year through imperfect burning, including all the different stages of the burn. Why then not try a kiln a certain way and note the results, and, if satisfactory, continue to do it that way? It is so easy, but some cannot let good enough alone.

A. V.

NO CLAY GOOD ENOUGH TO EAT.

The Theory of the Clay Eaters Exploded—Science Comes to the Relief of a Diseased People—Do not eat Clay for What They get out of it, but Because they have "Hook Worm."

AT DIFFERENT PERIODS, for near one hundred years, there have come forth writers with stories of a people that made clay one of their chief articles of diet, and these writings have found places in scientific publications of such standing as to cause the world to accept it as a fact, that there were people along the Atlantic coast country that ate clay for the taste of it. While difficult to locate a colony of such people, there was always enough truth in the story to enable cases to be cited; hence the recurrence of the story, and its acceptance, by a large number of those who would ordinarily have doubted the truth.

In this age of improvement in all things, the eagle eye of science has found that these people were the victims of a disease, and ate the clay to appease an abnormal appetite, on the same order as one finds in a higher class of civilization, namely: the eating of indigestibles of the order of pickles and kindred things, which seem to satisfy, because the abnormal or unnatural conditions demand something that will stay.

To Dr. Stiles of the Hygenic Laboratory, Public Health and Marine Hospital Service, Washington, D. C., is due the honor of discovering the seriousness and wide distribution of "hookworm" disease in our Southern States and of bringing it to the attention of physicians and the public, together with the means for its prevention and cure. His discovery is of a very late origin, but it is old enough to have been thoroughly tested, and the treatment laid down has, so far as known, proved a success in every case, and with the cure has come a taste for better things than were formerly craved by such a class. While on this part of the story, it may be well enough to go back and learn that it is supposed that the Egyptians knew of this disease nearly 3,500 years ago, but they did not know its cause, and it was not known until about the middle of the 19th century that it was an intestinal parasite. Since then it has at times been referred to, but within the last fifteen years it has been fully known that it was a parasite in the intestines, called *Uncinaria,* the common term for which is the "Hook Worm," or germ of laziness. Dr. Bondurant of Mobile, Ala., has done some splendid work on this disease, in the last few years, and has thrown some light on the subject, not known before. As early as the year 1808, Dr. Pitt said, and it is preserved in his writings, "That along the Roanoke river, in North Carolina, malaria or dirt eating prevails mostly among the poor whites, and negroes and originates in my opinion from a deficiency of nourishment." You see that this was the opinion of a man nearly one hundred years ago. He saw there was something wrong but did not know what it was, and he went further and said that the whole southern coast was more or less affected in the same way.

Now this worm that causes a desire to eat clay, that should be made into brick, is thus described by Dr. R. H. Lewis, of the North Carolina Board of Health: "The Hook Worms are about half an inch long. They live in the small intestines, where they suck blood, produce minute hemorrhages, and in all probability also produce a substance which acts as a poison. They lay eggs, which cannot develop to maturity in the intestine. These ova escape with the faeces, and hatch in about 24 hours; the young worm sheds its skin twice, and then it is ready to infect man. Infecton takes place through the mouth, either by hands soiled with larvae or infected food. Infection through the drinking water may occur. Finally the larvae may enter the body through the skin and eventually reach the intestines."

That gives the reader an idea of what the thing is and how it may affect one, but what follows here is of more interest to the readers of THE CLAY-WORKER than anything that has gone before.

Infection occurs chiefly in rural districts. Above the frost line the symptoms are more severe in summer than winter, and whites appear to be more severely affected than negroes. Persons who come in contact with damp earth are more commonly affected than others; so that the disease is found chiefly among *farmers, miners and brickmakers.* Severe cases are more common in women and children than in men over 25 years of age. 'Uncinariasis' is a disease which occurs in groups of cases, and if one case is found in a family, the chances are that other members of the same family are affected. The testimony of patients severely infected is unreliable."

Following the subject further, in a medical way, which I omit, the doctor comes to tell of the outward appearances of a person infected, which I give in full:

"In extreme cases there is a general lack of development; skin waxy-white to yellow or tan; hair is found on the head, but is more or less absent from the body; breasts are undeveloped; nails white; external genitalia more or less rudimentary; face anxious, may be bloated; conjunctiva pale; eyes more or less dry, pupils dilate readily; membranes pale according to anemia; teeth often irregular; tongue frequently marked with purple or brown spots; cervical pulsations prominent; thorax emaciated; heart-beats often visible; abdomen frequently with 'pot belly'; extremities emaciated, frequently edematous, and with wounds or ulcers of long standing."

Then follows the symptoms in all parts of the body, which I will omit, as one could not well miss a fellow with the "Hook Worms" after reading the above outward look. It is further stated that it is mostly found in the sand districts of the coast, or in what is called the "sand hills," a section reaching from Norfolk to New Orleans, in this country, and is even more prevalent in the South Sea Islands, and in Porto Rico is the chief cause of death.

The writer has lived in this section of the "sand hills," and has seen many people that evidently had the disease that caused them to eat dirt, but the only cases of dirt eating he calls to mind was that of children, that seemed to eat it for the meanness of the thing, but the pale face described above, the "pot belly," is a familiar sight in that section now; and one not used to seeing the little pale sickly looking pot bellies would think they were fit for the grave, yet they live long in that condition. It must be a great relief to people to know that these faces are the result of a curable disease, and that by proper hygiene they can be turned to rosy faced, healthy people.

MEERSCHAUM CLAY.

Hitherto the chief supply of this product has been obtained at Brusa, in Asia Minor, where it is found as a white earth in a bed of clay. Holes are dug till the bed of red clay is reached, and in this the meerschaum clay lies in isolated kidney-shaped pieces usually of about the size of a walnut and rarely larger than an average apple. As it happens, however, identical deposits exist in the red ground accompanying the stratified iron ore of County Antrim, Ireland. Its only use, so far as the Irish miners are concerned, has been as a healing plaster. But it is to be hoped that attention will be directed to the suitableness of meerschaum clay for other useful purposes.—Exchange.

HOW IT WOULD WORK.

If all men practiced what they preached,
We'd have no time for labor;
Each man would put in all his days
Endeavoring in pleasing ways
To boost along his neighbor.

Written for THE CLAY-WORKER.

SEVRES.

The World Famous Pottery—Where and How It Is Made.

SEVRES IS SITUATED about eight miles from Paris on the highroad leading to historical Versailles, and is known to have existed as far back as 560. It is celebrated for its magnificent manufactory of porcelain, which is now rebuilt in the Park of St. Cloud. It was formed in the Chateau de Vincent in 1738, but in 1756, the *Femiers-Generaux* purchased the manufactory and transferred it to Sevres. Louis XIV—the Sun King—at the solicitation of Madame Pompadour, one of the monarch's favorite ladies, bought it of them in 1759, and since then it has formed part of the domain of the State. The establishment in question consists of three distinct parts; the show-rooms or *magazines*, the museum, and the *ateliers* or laboratories. In the show-rooms are, beside table and tea services, of from 5,000 to 15,000 francs' value, splendid trophies, statuettes, vases, tables, cabinets of all sizes, admirable paintings upon porcelain, copied from the best masters with a nicety of execution and truth of color rarely attained on canvas. The prices of these range between 25,000 and 40,000 francs. The museums contain a complete collection of foreign china, and the materials used in its manufacture; a collection of the china, earthenware, and pottery of France, and the earth of which they are composed. Louis XVI, enriched the museum with a fine collection of Greek vases.

The models and specimens, which comprehend every kind of earthenware, from the coarsest pottery to the finest porcelain, forming a complete illustration of the history of the art, are arranged on shelves in the following order: 1. Etruscan vases, antique pottery, Grecian, Roman and Gallic. 2. Foreign earthenware, delft-ware, and stoneware, with some delft-ware of the fifteenth century, the first that was glazed, being the original specimens of Bernard Palissy, the famous inventor of common glazing. 3. French earthenware, delft-ware, and stone-ware dating from 1740. 4. An interesting representation of the manufacture of porcelain from the clay in its rude state to the finishing. 5. Porcelain of China, Japan and India. 6. Porcelain of the different manufactories of France, arranged in chronological order, with a progressive table of the qualities and prices to the present day. 7. Porcelain of Russia, Brunswick, Venice, Lombardy and Italy. 8. Porcelain of England, the Netherlands, Spain, Portugal, Saxony, Austria and Bavaria. 9. Specimens relating to the coloring of porcelain and earthenware, and of the defects to which it is liable. Among the objects which rightly claim more particular attention is an old mosaic of colored earthenware, encrusted in the floor, representing the British arms under different dynasties; also a stove in faience, in the shape of a model of the fortress of the Bastille, presented to the Convention by M. Olliver, who fashioned it; a stove also in the same material (faience) of Louis XIV's time, brought over here from Versailles, where His Majesty resided; models of Assyrian antiquities executed by M. Hartley; old bricks of the tenth century, etc.

The *ateliers* are on the ground floor; there is a room with whirling tables, at which the throwers and turners sit, gradually creating these beautiful forms for which Sevres porcelain is so esteemed. The clay is prepared and ground at a water mill about five minutes' walk from the manufactory, and brought here ready for use. The process of casting is resorted to when very thin porcelain is desired. The next process is putting on the handles, if any be required. The article is then taken to a room where women are employed in picking out any slight flaw they may discover, after which it goes into the hands of the painter. The painters' room is large enough to accommodate twenty persons; the colors employed are all mineral, and are generally different from what they are after baking. Gold is applied in a semi-fluid state, being first dissolved in aqua regia. The article, thus prepared, is taken to the bakehouse, which is in one of the courts. It is necessarily baked twice, once to harden it, and a second time for glazing; but painting and delicate articles must be baked a third time to obtain the full effect. Plates, cups, etc., are placed by twos, threes, fours, etc., into round pans with lids, called *casettes*, but so that they may not be in contact with one another. The *casettes* are then placed in the first furnace, which is heated either with wood or coal; the fire is underneath, separated from the *casettes* by a vaulted ceiling, through the apertures of which the hot air penetrates into the compartment above. The second furnaces are smaller, with doors of earthenware, which are regularly built in at each baking, a projecting tube being alone left so as to be easily opened to watch the operation. The glazing substance is obtained from feldspath, nicely ground. Paintings are placed vertically in furnaces made for the purpose. The furnaces occupy several rooms in different wings of the building. The porcelain originally manufactured at Sevres, called *porcelain tendre*, was a composition of glass and earths, susceptible of combining by fusion. It was abandoned on account of its effects on the health of the workmen, but successful attempts have since been made to revive the art. That generally manufactured, called *porcelain dure*, is formed of kaolin, from Limoges, alkali, sand, and saltpetre, to which, when in a state of fusion, clay is added. It requires great heat to be hardened, and wood alone is used. The *biscuia de Sevres* is this substance not enameled. The workmanship of the manufactory of Sevres is much more highly finished than that of any other manufactory in France.

CLAYWORKING INDUSTRIES OF FRANCE.

The following has been received from Consul-General Skinner, who is at Marseilles:

"The brick and tile industry of Marseilles is described by the Chamber of Commerce, in its last annual report, as one 'which represents the most important figure in the maritime business of the port of Marseilles, where it supports thousands of workingmen, representing a minimum of 15,000 inhabitants.'

"The last available statistics show a total sale during twelve months of 303,230 tons, of which 156,927 tons were exported to foreign countries. There are a number of companies engaged in the business, but they are completely overshadowed by the Societe Generale des Tuileries de Marseille. This important corporation corresponds fairly well with the American conception of a trust, as it consists of twenty-one concerns, now organized under the general title above given, with works, the most of which are located at St. Henri, a suburban district of this city. Inasmuch as the Societe Generale is the most important factor in the industry, and manufactures a more extended line of wares than any of the others, I shall confine myself to facts obtained from a representative of this company.

"All of the local clay products are burned in kilns and they are executed in all sizes, and, in respect to tiles, in many different colors; only red brick, however, are manufactured. While common and pressed solid brick continue to be produced in Marseilles, they may be said to have disappeared, practically speaking, as a factor in local building operations. The present-day output of the Marseilles brick kiln is a block perforated lengthwise, which is said to be not only much lighter than the ordinary brick, but equally durable, strong and cheap, less expensive to ship, and affording protection against humidity and heat or cold. It is claimed that the uniformity of hardness obtained in the manufacture of hollow brick provides more resistance to fracture than ordinary brick, and power to withstand steady pressure ten times greater than may ever be required for any purpose. They require less clay and fuel to produce, less mortar to lay, and enable the bricklayer to accomplish more work in a given time. The demand for this building material for external walls is said to be growing considerably in foreign countries, as it is also in this. In France, all partition walls are made of hollow brick, as are also the ceilings, upon which the plaster is spread without any lathing whatever."

Written for The Clay-Worker.

HOW MANGANESE IS MINED.

THE MANGANESE MINES of the National Paint and Manganese Company are located in Campbell County, Virginia, one and a quarter miles from Evington Station, on the Southern Railway. The manganese ore lies in a bold hill and is reached by tunnels driven into the hill. At the present time there are three tunnels or levels into the ore. The first is thirty feet below the surface, the second one hundred feet, and the third one hundred and fifty feet below the top of the hill. The picture, No. 1, showing the "Entrance to the Mine," is at the one hundred and fifty-foot level, which is the car level, and the ore mined in the upper levels and stopes is dropped down to the cars through chutes. The ore lies in a bed of yellow clay and between sandstone walls. These walls are known as the foot wall on which the deposit lies, and the hanging wall which covers it. The ore is in pockets varying from one foot to twelve feet in thickness, and extending from the surface of the ground down to and below the lowest level, where the ore is almost solid, showing that there is a large deposit of ore underlying the present workings. As the ore is mined out it is necessary to support the hanging wall by heavy timbers. As the ore is mined it is loaded on cars, which convey it to the washer, as shown in Illustration No. 3. On reaching the washer it is dumped from the cars into a large ore crusher, which reduces the large lumps to pieces not larger than an egg. It then passes through the washer, which removes all the clay and dirt, but not the rock, sand and gravel which is mined with the ore. From the washer it passes through separating screens, which remove all sand and small rock and gravel. It is then discharged onto a platform, where picker boys, as shown in Illustration No. 2, pick out all remaining rock and gravel, and the clean ore is left to be hauled to the depot at Evington, where it is loaded on railroad cars and conveyed via the Southern Railway to the mill at Lynchburg, Va. On reaching the mill the ore is again crushed to small particles and passes to the grinding mills, where it is ground and then bolted and screened, the various sizes of grain and powder passing to separate bins, from which it is barreled and goes to the stock house for shipment to the brickmakers. The quality of the manganese is high grade, analizing 47 per cent. to 50 per cent. metallic manganese and 76 per cent. to 82 per cent. oxide of manganese. The ore is very uniform in quality, and is prepared with great care at the washer and at the mill. It is, as shown, all carefully hand picked at the washer, and after being ground is all bolted, which insures uniformity of quality and size and justifies the claim of the National Paint and Manganese Company that they furnish the best manganese on the market for brickmaking. Some dealers who offer manganese for sale appear to think that any kind of manganese is good enough to put in bricks, just so it is cheap, which is a great mistake, as the spoiling of a kiln of brick by poor quality or irregular size manganese is a very serious loss to the brickmaker. The National Paint and Manganese Company extends a cordial invitation to all brickmakers to visit their mines and mill and see for themselves the careful methods employed to furnish them with manganese that will give them satisfaction at all times.

Entrance to the Mine.

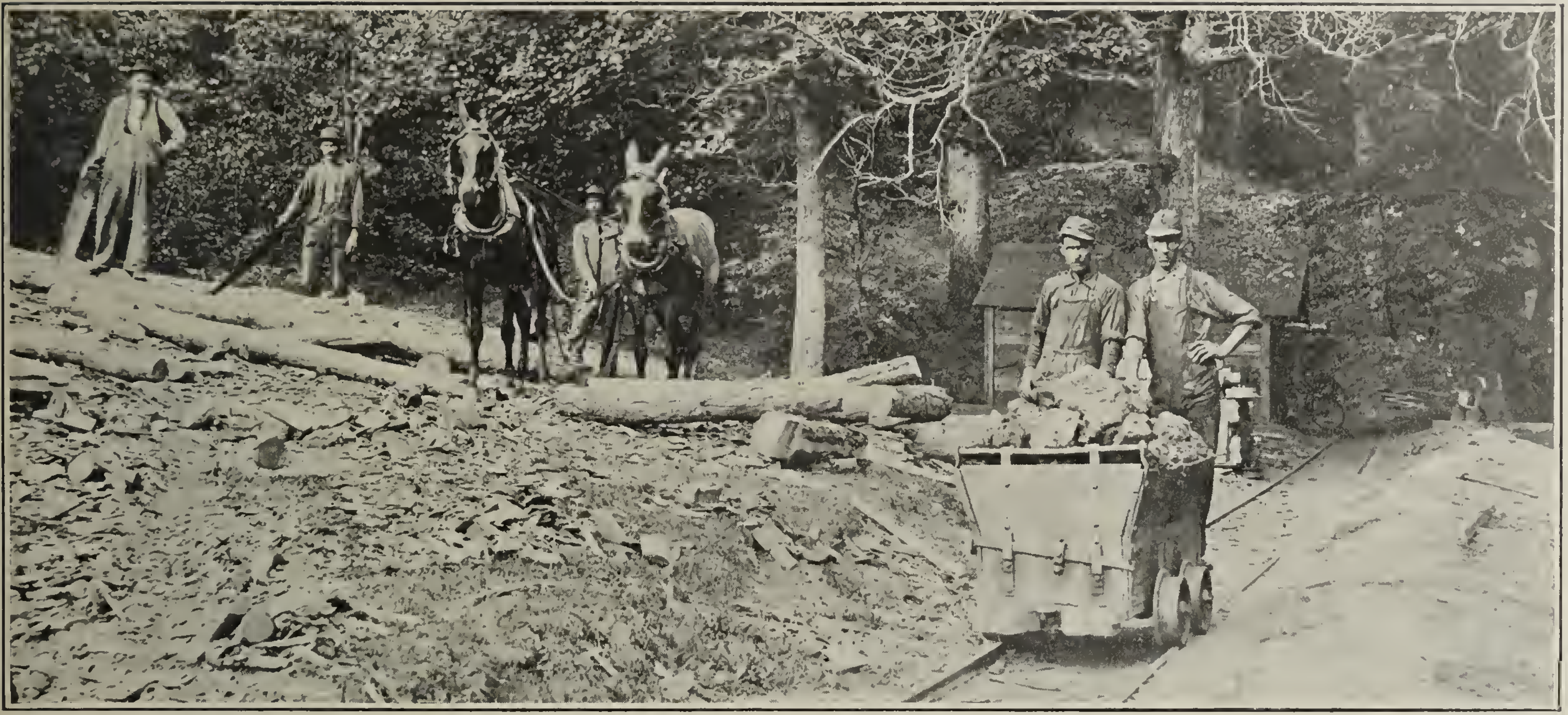
A CHEERFUL MANUFACTURER WHO ENJOYS THE FRUITS OF STRENUOSITY.

In these days of business pessimism it is refreshing to meet a prominent manufacturer who refuses to be blue. Mr. E. R. Miller, secretary of the W. E. Caldwell Company, of Louisville, Ky., was encountered lately by one of our representatives and asked his views as to the present condition and future prospects of business in his line, which is the manufacture of tanks and towers for numerous purposes, including fire protection, water works for smaller municipalities, for country homes, florists and nurserymen; also tanks and tubs for distillers, brewers, tanners, laundrymen and the like. As the business of the W. E. Caldwell Company extends all over the country and deals with so many lines of industry it was thought that Mr. Miller would be able to give a very good idea of actual conditions. He said:

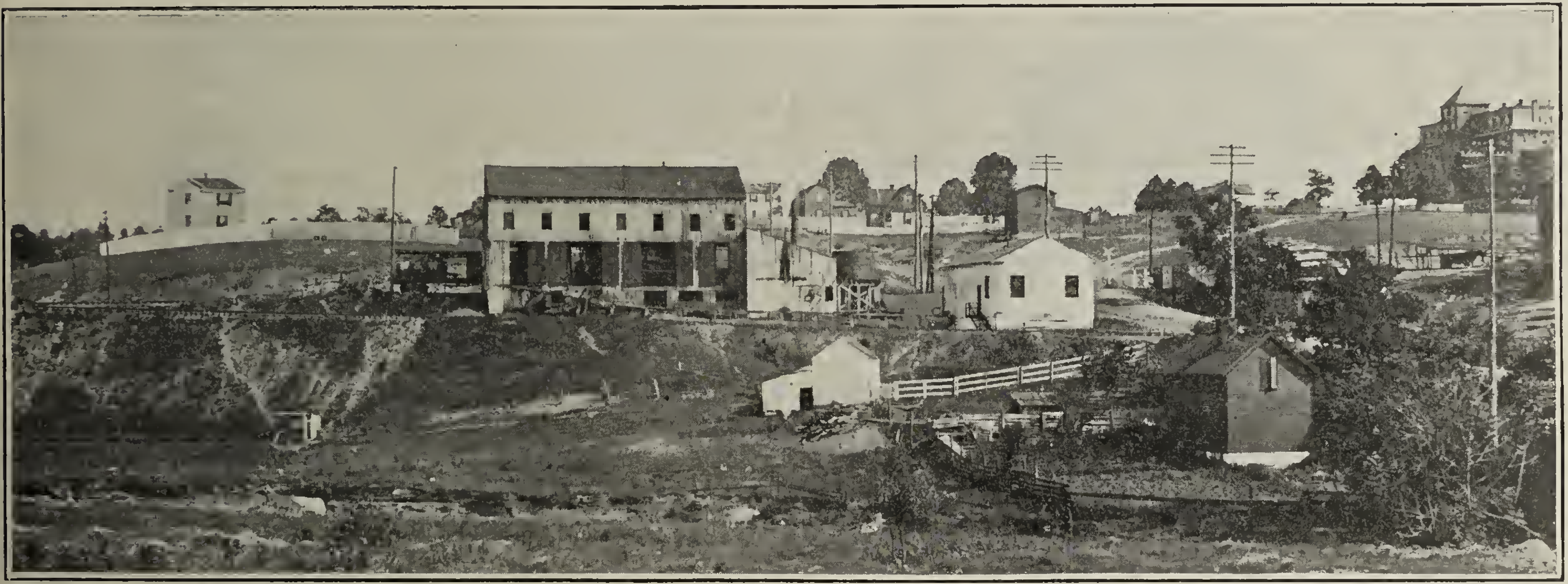
"Like everybody else, we saw the present lull in business coming. We made up our minds, however, that if by any effort on our part we could prevent a curtailment of our business, that effort would not be spared. While it is probable that the aggregate business in our line has fallen off some during the last six or eight months our own trade has increased somewhat, and right along our new orders have been a little more numerous than those of last year, which was the most prosperous that we had had in a quarter of a century.

Boys Picking Manganese Ore.

"To begin with, we made a much more thorough distribution of our 1904 catalogue than we had ever done with any earlier issue. We directed and shipped out in all over four carloads of catalogues. We also made a much more thorough exercise of our follow-up system used in connection with our advertising in the trade papers, and, of course, we kept our salesmen going The result has been very gratifying. We feel that we have had



Car Carrying Manganese Ore from Mine to Washer.



The National Paint and Manganese Company's Mill at Lynchburg, Va.

Group of Mine Employes of the National Paint and Manganese Co.

more than our share of business, although naturally very little of it has been in connection with the building of new plants. One aspect of the general reaching after economy has been decidedly beneficial to us. Many manufacturers have found upon inquiry that they could reduce the cost of their insurance by using an independent water supply in connection with their sprinkler systems, and these have come to us for their tank and tower outfits, the first cost of which they saved in a short time through the premium economy. As to the distribution of our business, it has naturally been especially good in the South, which has not yet felt the pinch of business curtailment. Still we are very much gratified that in all sections we have at least held our own, and in many have done better than in our banner year."

Written for THE CLAY-WORKER.

THE OUTLOOK—No. 4.

Worked by the Workers and Struck by the Strikers.

In FIGURING upon the future prosperity of an industry, one must not overlook the labor situation. The relations of employer and employe must be taken into consideration in the intelligent discussion of this question. The supply and demand for labor has a direct bearing upon the good or ill of all industries. Once upon a time it was no difficult task to define the mutual relations of capital and labor. If one wanted men for work, he named his price and got his men, selecting such as best pleased him among those that offered. If he failed to get men at prices offered, he could either let the work go undone or raise wages and thus draw a larger army to his standard. He asked no man's advice as to who should take precedence among his men, for he was the boss and sole judge of the merits or demerits of his workmen. If the work of one man pleased him better than his co-laborers, he could make him foreman, superintendent, or even partner, if he chose, and no one thought of disputing his rights in the premises. If any were displeased with any proceedure, they could call for their pay and seek other employment, and the employer could fill the vacancies or any new places he chose from an open labor market, and when the work was done, he could discharge all or part of his force and consult only his own interest as to whom he should keep and whom he should discharge. The laborer sold his commodity in an open market, and the employer could pay his money and take his choice.

This from time immemorial has been the doctrine of mutual rights, and not until these later days has the idea of right been disputed. I do not wish to enter into an extended discussion of these rights, as they have no direct bearing upon my subject. I can best illustrate my ideas upon this subject by relating a page from our own history, and perhaps make it all plainer by practical demonstration.

Did you ever wake up on a bright summer morning and go to your work feeling yourself complete master of the situation—plenty of sales at good prices, plenty of work to be done, plenty of workers to do it, and plenty of money coming in to pay for it all, and ere night closed in, you found the tables completely turned upon you? You started out that morning feeling that you were the boss of the brickyard, but night found you wondering "where the boss was at." You thought you were a skillful worker of men, but soon came to the conclusion that your men were beginning to work you. Did you ever face such a state of affairs? If not, you have no idea what real work is. The man who wields the pick and shovel has a snap in comparison to your job.

You can't commence at 7 a. m. and quit at 6 p. m. You must begin as early as your wife will wake you, and keep it up until you find sleep from sheer exhaustion. That is what it means to have your men work you. You may have been a hard taskmaster, but you were a tenderfoot in comparison to the laborer when he gets the whip in his own hands. Did you ever hear him crack his whip, and give his commands as though he owned not only the whole brickyard, but the rest of the township besides? If you never worked before, you will buckle down to it then. Do you ask how I know so much about it? Well, I have been all along that line. I have been worked. I have worn the yoke, and I must confess that neither was the yoke easy nor the burden light.

The summer of 1903 will live long in my memory as the hardest tussle of my life. It was hustle and rush from beginning to end, and when we balanced our books at the end of the year, we found that we had accomplished very little more substantial results than during many years that men called hard times.

We have weathered several storms in a short business career, but of all the panics which I shall dread in the future, the labor panic easily takes precedence. To begin the year 1903, we voluntarily raised our men's wages 25 per cent., and thus secured a good crew of men. That was a good beginning, but did not bring us an equally good ending. One after another of our best men heard stories of great wages being paid in other sections and went out to try their fortunes. Every morning found vacancies to be filled or work hampered by lack of laborers. Every night found me ransacking those parts of town where idlers were wont to collect, vainly endeavoring to fill up our decimated ranks. But it was no use. The fever was upon the men, and nothing but impossible wages would hold them. We called a council of war, and viewed the situation in all of its bearings. There was no doubt of the gravity of the situation. We needed men and needed them badly. The weather was all right, the brick market was all right, the plant was all right, but the labor market was in a deplorable condition when viewed from the employers' standpoint. But we decided that any further advance in wages was out of the question, and I was told to go ahead with the force obtainable and conduct the campaign as best I could under the circumstances. It was a motley force that answered to the roll call on Monday morning after that conference. One-half of them had never seen a brick factory, and one-fourth of them were boys under twenty years of age. But they knew their own business well, if they did know but little of ours. They set their own speed at all work, and it was impossible to urge them out of their snail's pace. One had only to mention to a man that his motions were rather slow to call out the answer, "Pay me!" and the self-discharged employe walked to the other side of town and secured a job of our competitor, for all were in the same condition—trying to make double the amount of bricks possible under the circumstances. No amount of overseeing would make any increase in the daily output, for each man was a law unto himself, and felt as secure in his situation as if he owned a controlling interest in a dozen brickyards. He set no value upon his job, for he knew that if he lost it to-day he could secure another just as good to-morrow. So what handle had the superintendent by which to control the men. We simply took what they gratuitously offered for services, held in check our wrath to the best of our ability, and kept whatever force we could. Orders still came in faster than we could fill them, and we turned down many good contracts because we foresaw the impossibility of filling them. We almost dreaded to open the mail for fear it would bring us another order. For once in its history there was no boss at our factory, or it were nearer the truth to say that there were more than a score of bosses. I still held the doubtful position of general director, time-keeper and paymaster, but there my duties ceased. Whatever amount of work a man did between the hours of 7 a. m. and 6 p. m. was accounted a day's labor, and he drew a day's wages therefor. L. C. MOORE.

(To be Continued.)

Rochester, N. Y., has a building boom. There is three times more building going on now than in any other year in the history of the city. Masons and carpenters are in great demand and will be for the full season. Contractors are giving all employment that apply.—*Exchange.*

BY THE LIGHT OF THE KILN FIRE

THE CLAY TEMPERER'S "HOODOO."

"WHEN I WAS conductor on the W. C. Road," said the man who kept the sweep horses on the move during working hours. "When you was conductor on the W. C. Road!" exclaimed, derisively, a chorus from the men who lounged in front of the arches.

"Yes, when I was conductor on the W. C. Road, ten years ago, I saw some queer things. I tell ye, ye can't tell what's goin' to happen. I was conductor about a year, conductor of a mixed train. I'd been assistant super of that road now, probably, if it wasn't for the hoodoos. You see, 'twas like this. Our general manager was a dreadful self-important man. He'd come up from newsboy to part owner and chief boss of the outfit, and he felt his oats. I'd seen him several times at his desk when I went into his office, but never got a look at him that would stay by me. One day I was ordered to stop at a clearing in the woods near a brook twenty miles from a stition and take on a party of fishermen who would be waiting there. Well, we stopped all right, and I saw the last man of them safe on the car platform and signalled to go ahead, then I mounted the pilot seat in the caboose to overlook the train. Pretty soon I looked down from my high perch and saw a red-headed giant in hunting costume, and I made up my mind he was Bill Bridge, who used to run in the fire company with me years before. We used to have the usual fireman's off-hand way of talking, and so as soon as I recognized Bill I sung out— "Hallo, there, you damn red-headed son-of-a-black and tan! Where ye been anyhow, and what in 'ell you beatin' your way on this line for?"

The big red-head turned slowly up and the sight of the face under it froze my blood. It wa'nt Bill, but the chief mogul himself. My career as a railroad man ended right there. I traveled to the next station as a deadhead passenger, with my wages in my pocket. Funny break, wasn't it?

"But, then, I lay it to the general luck of the W. C. Road. There was always the most amazing surprises going on about it. I was in the caboose one day, looking out over the cars ahead, when, suddenly, I saw a man fly from under the wheels and sail gracefully over into a bog. I yanked the train to a stand, and a relief party went to find the man. They found him nearly suffocated in the bog, but not a scratch or hurt on him. He was a tramp, he said, and he was stealing a ride on the wheel frame of a flat-car, when he was sent shooting out from under it, he didn't know how. We didn't either. When we got to the end of the run one of the car inspectors called my attention to the trucks under one flat-car. The trucks under one end were wrong end to. That is, the front end was where the rear should be. We investigated and found that them trucks had turned on a pivot under the car while the train was doing thirty miles or better, and that's what happened to the tramp. How them wheels ever jumped the rail, whirled, and came back on the rail, completely reversed, without causing a wreck, is one of the mysteries. The other one is how the tramp was saved from injury. I understand that the tramp quit hoboing right there, and travels first-class now.

"Another time I came into the end of the run and brought my train to a stop at the station. When we tried to start again to shove some of the cars on a siding, we found the train wouldn't budge. We went over the train and found a set of trucks under a heavy box-car turned sideways, the whole resting at right angles with the truck. They anchored us completely there, but I found out soon that those wheels had gone more than seven miles in that position, over seven crossings and a dozen frogs and switches, and only pulled up three crossings and one frog.

"How do I account for it? Simply to the hoodoo to the W. C. Road. The hoodoo that got me to sass the manager and lose my job; that throwed me out of a place, where I might a been an ornament to the world, down to driving the grinders in a mud yard.

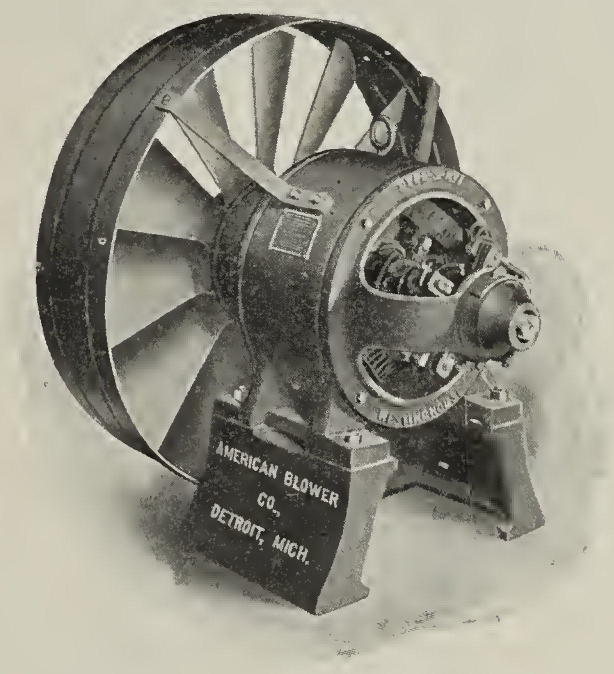
"Don't tell me there hain't such things as luck and hoodoos! The W. C. Road's History's agin ye—Bah!"

THE DREAMER.

IMPROVEMENT IN DIRECT-CONNECTED DISC FANS.

Attention is called to the very striking illustration of progress made in the line of direct-connected disc fans and motors, the fan being a modification of the well-known American Blower Company's "A. B. C." fan, which has been on the market perhaps longer than any other, and is in more general use.

Previous to the working out of this design, the custom has been to attach a motor to the arms of a disc fan, but the excessive weight of the motor overhung in this way, has often been an objectionable feature. In this combination the motor is placed on a substantial base, there being no bearings except those in the motor. This makes by far the most rigid form of construction, and at the same time most compact, the total width of the outfit being no greater than with the overhung type.



Direct-Connected "A. B. C." Fan.

The exceptionally high efficiency of both the "A. B. C." fan and the Westinghouse motor, together with the fact that the prices charged are very low, makes these outfits unusually desirable for cooling and ventilating.

Further information can be obtained by addressing the Detroit office of the American Blower Company or any of its branches.

SCARCITY OF MEAT CAUSES TROUBLE ON BRICKYARDS.

The Fishkill (N. Y.) *Herald* says that the meat strike is causing serious inconvenience to the brickmakers. Brick is very scarce and there is a demand for them. At most of the yards foreign labor is employed. Meat is so scarce that the boarding-house keepers cannot get it. At the boarding-houses the men have been cut somewhat. They believe that the bosses are doing it, and consequently will not work. On one yard recently there were but two machines running, where seven should have been going. The same conditions existed on some of the other yards. It is a serious condition.

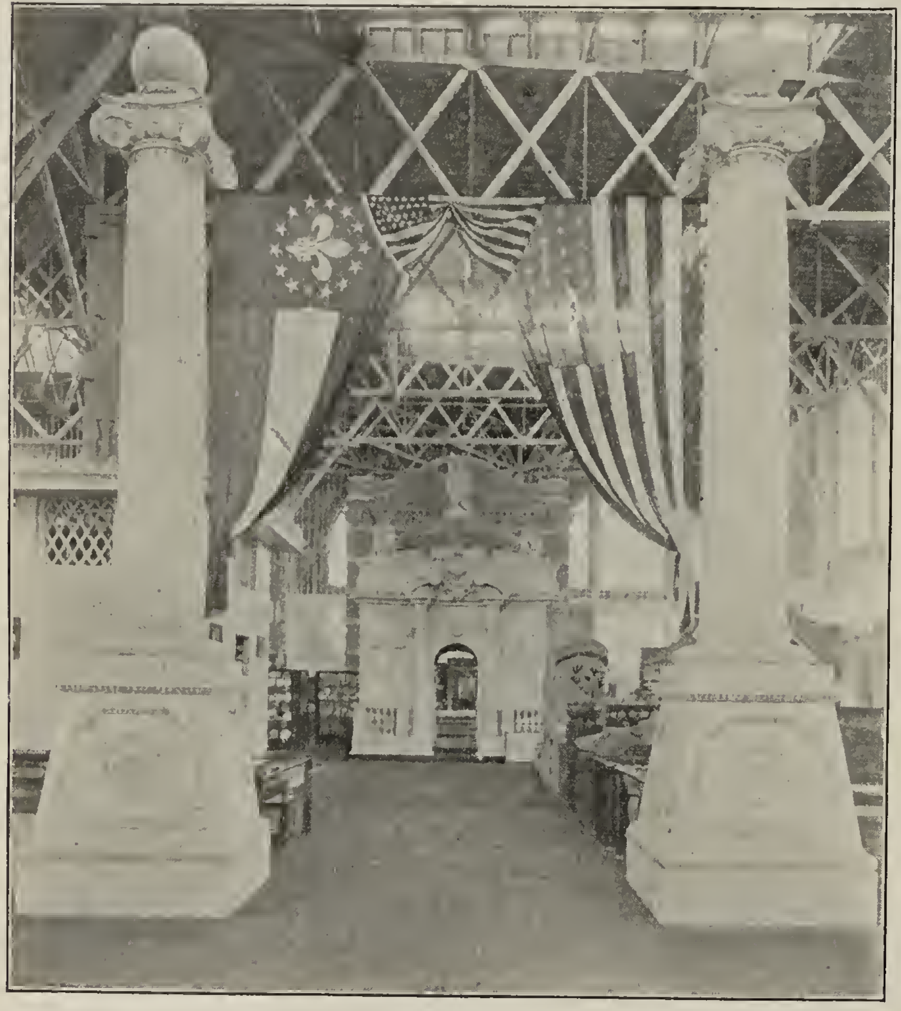
Written for The Clay-Worker.

TERRA COTTA AT THE WORLD'S FAIR.

Object Lessons in Modern Architecture—Beautiful Specimens of Enameled and Glazed Ware Which Demonstrate the Superiority of American Manufactures.

THE BUILDING TRADE has a well defined conception of what is meant by the words "terra cotta" until they begin to carefully study the exhibits at the World's Fair. After thoroughly inspecting all the domestic and foreign exhibits, they will then realize that it is a very broad term which covers a great range of material. They will find material that merges into faience on the one side and into stoneware and earthenware on the other.

Using the classification that terra cotta is a hard-burnt clay product that is used for architectural and decorative effects, they will find exhibits that will surprise at least the laity, when designated as terra cotta. The terra cotta manufacturers do not hesitate to apply the term to their entire product, whether it is glazed or unglazed, or whether the glazed is translucent or opaque. They will therefore be surprised to find that the Rookwood Pottery in its recent departure in the field of terra cotta call their product "faience," although it is terra cotta with a translucent glaze.



Entrance No. 1 to the Clay Industries Exhibit. Columns by the Excelsior Terra Cotta Co.

In the Italian section will be found a most beautiful series of reproductions of classic statuary in a soft, cream-colored material, which might be mistaken for ivory at a distance, and which the manufacturer terms terra cotta. As an inspection of this material shows a total absence of the "grog" that is regarded as so essential by the architectural terra cotta maker, and as it has a fine-grained body, it suggests stoneware or hard-burnt earthenware rather than conventional terra cotta. As in all classifications, it is difficult to draw the dividing line, and this is painfully realized when the terra cotta exhibits are carefully studied, as they will be found to range from art pottery on the one side to earthenware on the other side.

First, taking the terra cotta exhibits in the Clay Industry display, the student is greatly impressed by the beautiful pavilion exhibited by the Northwestern Terra Cotta Company and designed by its secretary, Mr. Fritz Wagner. It is essentially a square pavilion, about 14x14 feet in size, made up of white enameled terra cotta, capped by a matte green dome and resting on a base of dark brown glazed terra cotta. The pavilion is entered by four Roman archways flanked by Ionic columns, and over each doorway is a pair of reclining female figures. A group of three urchins, symbolizing art, science and industry, surmounts each corner of the pavilion, and an eagle with extended wings is perched on the top of the dome. In the interior are four niches finished in a soft, pale green color, in which rest sample glass jars of the crude materials. Four panels in a delicate, light brown finish present very artistic figures symbolizing art, science, commerce and industry, with a transparent effect that is most pleasing. The entire study is glazed terra cotta, and while the exterior is somewhat trying from the monotone of the body being pure white, it is a masterpiece as regards technical skill. The joints are well made and the uniformity of the colors is remarkable. It is a fine conception, in excellent proportion, and executed with the most flattering skill.

Adjoining this pavilion is a pair of Ionic columns, which form Entrance No. 3 of the Clay Industry display, also made by the Northwestern Terra Cotta Company. They are executed in a rich brown, relieved with a liberal sprinkling of black spots, and makes a fine contrast with the glazed material in the pavilion. They have a softness and feeling that is painfully absent in the white enameled goods, and to many the color will appear far more effective for decorative purposes. The columns rest on a base of cream-colored brick and are capped by an eagle standing on a ball.

The *Excelsior Terra Cotta Company,* of Rocky Hill, N. J., has erected Entrance No. 1 of the Clay Industry Exhibit. It consists of a pair of Ionic columns, on Egyptian bases, that are executed in a dead-white glaze which is evidently the result of the sand blast. The workmanship does not show the same care in its details as do some of the other exhibits, but the soft surface is most pleasing to the eye and the design is very imposing.

The *Perth Amboy Terra Cotta Company* exhibits, at Entrance No. 4, a pair of fluted Doric columns, which are also finished in a dead-white or sand-blasted enamel surface. They rest on bases of white enameled brick and present a very fine appearance. The shaft of the column is made in three sections, one of which is over six feet in length. The difficulty of handling such a large individual piece is apparent when the joints are examined. The results are very satisfactory on the whole, however, and speak well for the courage and ability of this company.

The *St. Louis Terra Cotta Company,* in Entrance 2, exhibits a pair of fine cream-colored columns that were designed by Mauran, Russell and Garden on lines that follow the Renaissance. The shafts, which were pictured in the July Clay-Worker, are fluted and are capped by the burning lamp of knowledge. The technical execution of the work is admirable and the color is very uniform, and the exhibit is a most creditable one in every respect.

The *South Amboy Terra Cotta Company* exhibits in the New Jersey space, a small Ionic column in a gray color that is quite pleasing, but the mechanical execution is not satisfactory.

The *Steiger Terra Cotta Company,* of San Francisco, exhibits a very pleasing panel of "Spring" in a soft cream color. It is a very artistic conception and has been executed in a broad manner. It shows a high grade of workmanship and a skill in designing that is very complimentary to this Western company. They also exhibit a classic urn of conventional design that also shows very meritorious work.

The *American Terra Cotta Company,* of Chicago, exhibits some beautiful pieces of art pottery and a panel in wash colors that will be taken up under a study of faience. While the shapes and designs are strong and show considerable originality, the main beauty rests with the successful color results that have been secured by the glazes which they have so thoroughly mastered.

None of their exhibit gives the usual idea of architectural terra cotta, as they seem more ambitious to acquire the same reputation in art pottery that they have already earned by the architectural monuments they have erected throughout the country in building terra cotta.

The *Winkle Terra Cotta Company*, of St. Louis, exhibits a mantlepiece in the Clay Industry display that is quite pleasing for its fine rich, dark red color. The design is quite imposing and very rich in conventional ornamental details. With it is exhibited a very unique settee in a gray colored terra cotta that is quite odd, though very effective. They also exhibit some very large flower urns for garden decoration that are good. They exhibit a series of glazed samples in royal blue, white, cream and brown that are very smooth and clear, and which as yet exhibit no sign of crazing. This company also exhibits, in the Missouri space, some columns of dark gray terra cotta that are very uniform in color and have a fine, sharp finish and attractive design. They are part of a small pavilion and rest on a base of glazed terra cotta made to imitate granite. The soft gray columns speak volumes for the much finer appearance and far more pleasing color that legitimate terra cotta presents to the affected imitation of stone work, like the granite imitation base.

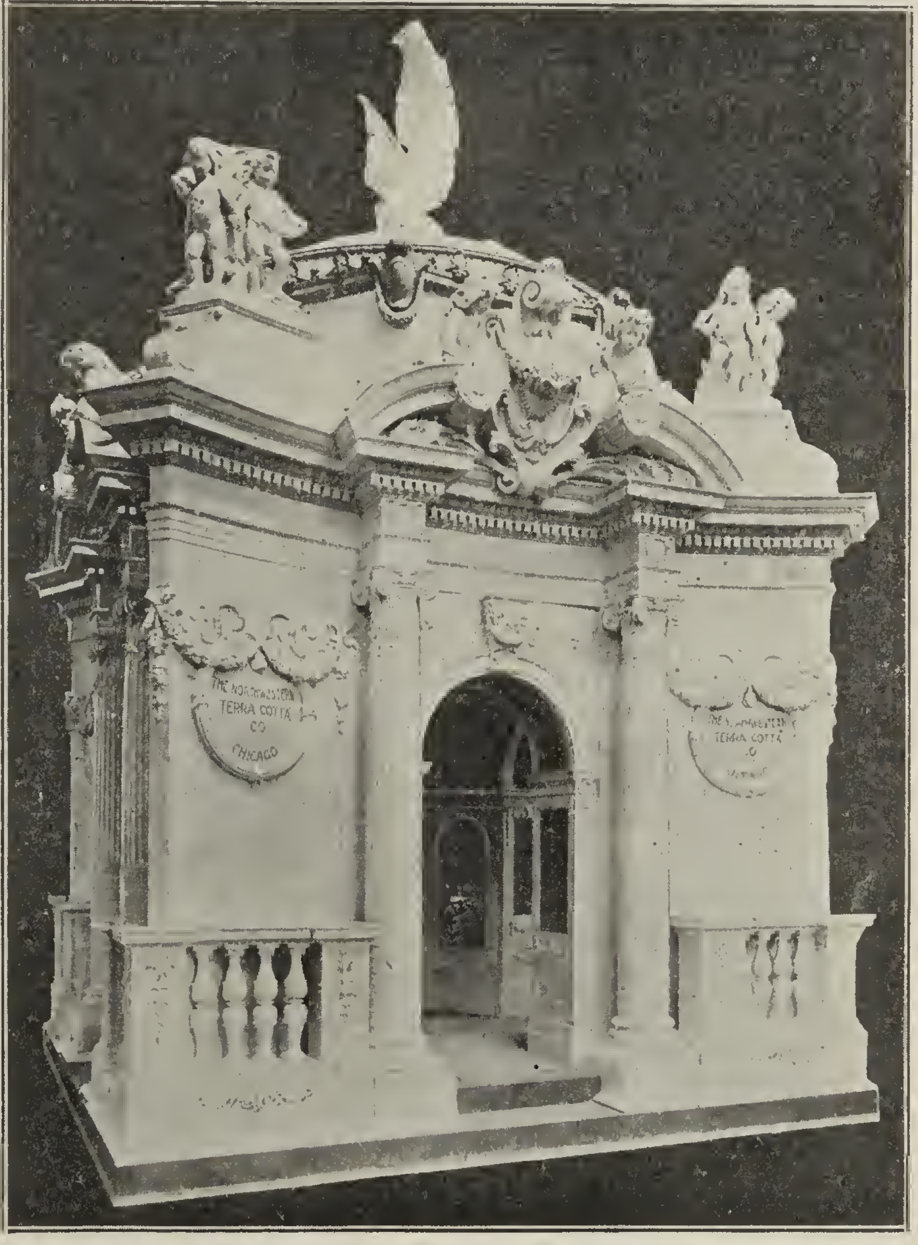
The *Winkle Terra Cotta Company* also exhibits in the northwestern corner of the Manufacturers' Building, a beautiful pavilion in light gray, matte glazed terra cotta, which was illustrated and fully described in the May CLAY-WORKER. It is octagonal in design, and is richly embellished with figures and conventional decorations. At each corner of the pavilion are niches in which are figures symbolizing sculpture, architecture, chemistry, and mining, or the four requisites for the successful production of terra cotta. The dome is surmounted by a figure of Atlas bearing the world, while eagles, with extended wings, surmount the Roman archways over each doorway. While it is a monotone study, the delicacy and softness of the coloring and the able execution of the fine details are so well carried out that this exhibit forms one of the masterpieces of the Exposition. The pavilion is enclosed within a terra cotta balustrade of a soft gray speckled color, with heavy newel posts, on which there is much careful detail work. The floor of the exhibit is paved with a 6x6 hard-burnt tile in light and dark gray, so that the entire exhibit is a complete study of architectural terra cotta that has been admirably conceived and most ably executed.

The *Atlantic Terra Cotta Company* exhibits a few specimens of Ionic capitals in white enameled terra cotta, and also some samples of cornice and coping work in white and gray.

The *Rookwood Pottery* exhibit is a reproduction of some of their recent orders, and is exhibited to show their regular work, rather than a special exposition effort. In this new departure of this famous art pottery are some very successful productions in decorative terra cotta. The central study is a portion of a reredos that was executed for a church in New York, and is a beautiful piece of glazed terra cotta in soft matte colors. Portions of the interior decoration of the Twenty-third street and the Eighty-sixth street stations of the New York subway are also exhibited, that show the successful application of very uniform color work in matte colors to decorative architecture. Samples of cornices and mouldings are also exhibited in grays, blues, greens and browns, in both matte and semi-glazed finish. The soft matte finish in permanent reliable colors has been produced without the aid of the sand-blast, and it marks a great advance in the decorative terra cotta work in this country. The Rookwood people are now promising to accomplish in terra cotta what they did years ago in art pottery, or take the initiative in building up new and original designs on lines that enable us to again advance beyond the Europeans. As in most clay products, the Americans are still imitators of the European manufacturers. The St. Louis Exposition enables Americans to once more realize that we are slowly but surely beginning to win our position in the ceramic world. Although the Rookwood people have been at work for less than a year in this new department, their technical success is most pronounced and extremely encouraging. It is true that they have the exceptional technical skill of Mr. Stanley Burt and a corps of artists and designers on which to support this successful career, and to whom the success of the Rookwood Art Pottery is so largely due.

The *Hartford Faience Company* exhibits a mantel in the Clay Industry exhibit that is on the border line between terra cotta and faience, and though it can be appropriately discussed here, it is such an exceptional masterpiece in artistic design combined with rare technical skill as to be worthy of the special article.

In the *Italian* section are a series of reproductions of classic statuary in a close-grained ivory-colored ware that is termed terra cotta. The practical terra cotta maker will rightly call it earthenware, as there has been no necessity to obtain accurate shrinkage and close fitting, and hence it is possible to omit the grit or "grog" that the architectural terra cotta maker finds so essential. This has enabled a very smooth finish to be put on the goods and made it receptive to the old ivory color that is so successfully employed, in which the Italians are adepts. The work is almost exclusively imitative, though some excellent subjects have been selected from old Roman and Grecian statuary. A few garden vases and flower boxes are shown, but these seem to be minor features of the two Florentine exhibitors, or the Manifattura di Signa and the Dini Works.



The Exhibit of the Northwestern Terra Cotta Co.

WAGES IN RUSSIA.

In no other country of Europe are wages so low as in Russia, says the World's Work. American workmen earn twice and even three times as much. The average monthly wages paid in the departments of Moscow and Vladimir are as follows: Men, $8 to $8.50 a week; women, $6 a week; youths between 15 and 17, $3.50 a week; girls between 15 and 17, $3 a week; children of both sexes, $2.50 a week.

Written for The Clay-Worker.

BURNED CLAY VS. ARTIFICIAL STONE.

The Colonel Takes a Second View of the Cement and Concrete Building Block Exhibits at the World's Fair, but Still Pins His Faith to Burned Clay as a Building Material.

"WASN'T IT YOU TOLD me to go over and look at the cement display?" asked the Colonel as I bumped into him one evening at the upper end of the Pike on the Fair Grounds at St. Louis.

I merely smiled and nodded, for I was not sure what was coming. In fact, I had not visited the cement display myself, but supposed it was there, all right, for I had seen some pictures and descriptions of it. Later I had passed around that way and found that they were just getting started to build the structure that is to contain the cement display, and from the way they are getting along, it looks like it will be the last thing finished, and the Fair will be more than half over before it is done.

"Well, by gad, sir," he said, "I don't know whether you were trying to play a joke on me then, or whether you were just bluffing, but I'll tell you what I did. I wandered out to the place where my little map of the grounds says the cement display is, and do you know, the most prominent thing I found there was a string of Colorado burros, and a fellow tried to get me to ride one. I went over there, sir, thinking that maybe I had been a little too harsh about this cement block proposition, and had a kind of sneaking feeling that maybe some of the things they would show me would make me wish I hadn't said some of the things to you that I did, and there I found a lot of burros tied to the fence, and where the cement building ought to be they have just got started to build. And they will have to get a different move on them than they showed while I was around there if they expect to get in on this show for much. Usually the cement men are very enterprising, but they are certainly bringing up the tail end of the procession here."

The Colonel looked at me a minute as if he had about half a notion to say something and another half not to, then we took a seat in the pavilion over by the Hale firefighters. I ordered a couple of steins by way of making amends for sending him on a wild-goose chase.

Setting his half empty stein down, he said: "Yes, I will tell you about it, sir, for now that you've got me started, I might just as well see the thing through. I wandered around in the Mines and Metallurgy Building, where I saw both cement building blocks and those new-fangled brick made out of sand and lime. I stood for quite a while admiring the model factory one of those sand-lime brick concerns have built there. It shows commendable enterprise, sir, I want to tell you, and while I am still firm on the old clay brick idea, I admire and respect enterprise of this kind. But it was the cement block people that I finally turned my attention to, and I found them making quite a nice showing. I nosed around awhile and finally I found another fellow that was interested in the matter, and we went off to a place where we could rest and have a talk together."

"What I want to know about this thing," I told him, "is where and how does the advantage come in? Are the cement blocks cheaper than brick, or do you base their claim for recognition on their being better?"

"Both," he said.

"Chop off one on quality," said I, "and you'll spare me the pains of taking you up the cascades to show you."

"Well, even say we chop off one for the sake of argument, we still have cheapness, not only in making the blocks, but also in putting them into a building."

"Please to analyze, sir," said I.

"As how?" he asked.

"As how? Do you think I am going to accept an abstract statement on a matter of this kind? If cement blocks are cheaper than brick, how is it? How do you figure it? And just to start with, can you tell me how much it costs, say, per cubic foot, to make cement blocks?"

"Well, he said, so much depends on circumstances and local conditions, that it would not be practical to give a cost figure that would apply generally. Some places near the source of supply, cement would have an advantage on that point, while others, who might have no advantage there might have a specially cheap supply of sand."

"Do you know, by gad, sir, that I have heard so much of this beating around the bush, this hiding behind a hedge of conditions and not giving straight answers to straight questions, that it worries me when I hear it. So, just to cut that all out, let us suppose you have cheap sand. Is sand now, or was it ever any cheaper, generally speaking, than clay? Is it more plentiful? We know there are places of lots of sand and no clay, and other places of lots of clay and no sand, but generally speaking can you lay claim to sand being cheaper than clay? Take it here in St. Louis, for example, and is it?

"Of course he couldn't answer that, so I said, where does your cheapness come in; is your cement cheap?"

"No, cement is not so cheap, but it don't take but a very small lot of it, and then it sets itself; you don't have to put it in a kiln and burn it."

Exposition Statuary, "The Cowboy's Frolic."

"That sir, is just the corner I wanted to get you in. You may not burn the cement, but the other fellow does, and burns it good and hard, too, and you can just bet your bottom dollar it costs him more to do it than it costs us to burn brick."

"Well," he said at last, "we have got one cement leg to stand on, any how, and that is in the cost of putting the walls up. You have to have a mason, one of the highest priced skilled laborers going to lay a brick wall, while with hollow concrete blocks almost any one can do it."

"Sir, I have heard that several times, and I have generally considered it too insignificant to answer, but you seem to be taking it seriously. Why, sir, do you forget that your technical papers insist on keeping ignorance from getting mixed up with concrete work, lest the whole trade suffer from the failure of poor construction? No, you needn't tell me that applies specially only to floors and other construction that is done on the ground, and not to concrete blocks, for I am taking all that into consideration. And now I want to ask you a question. If you were going to put up a stone house, would you do it with any jack-leg, or would you get a stonemason?"

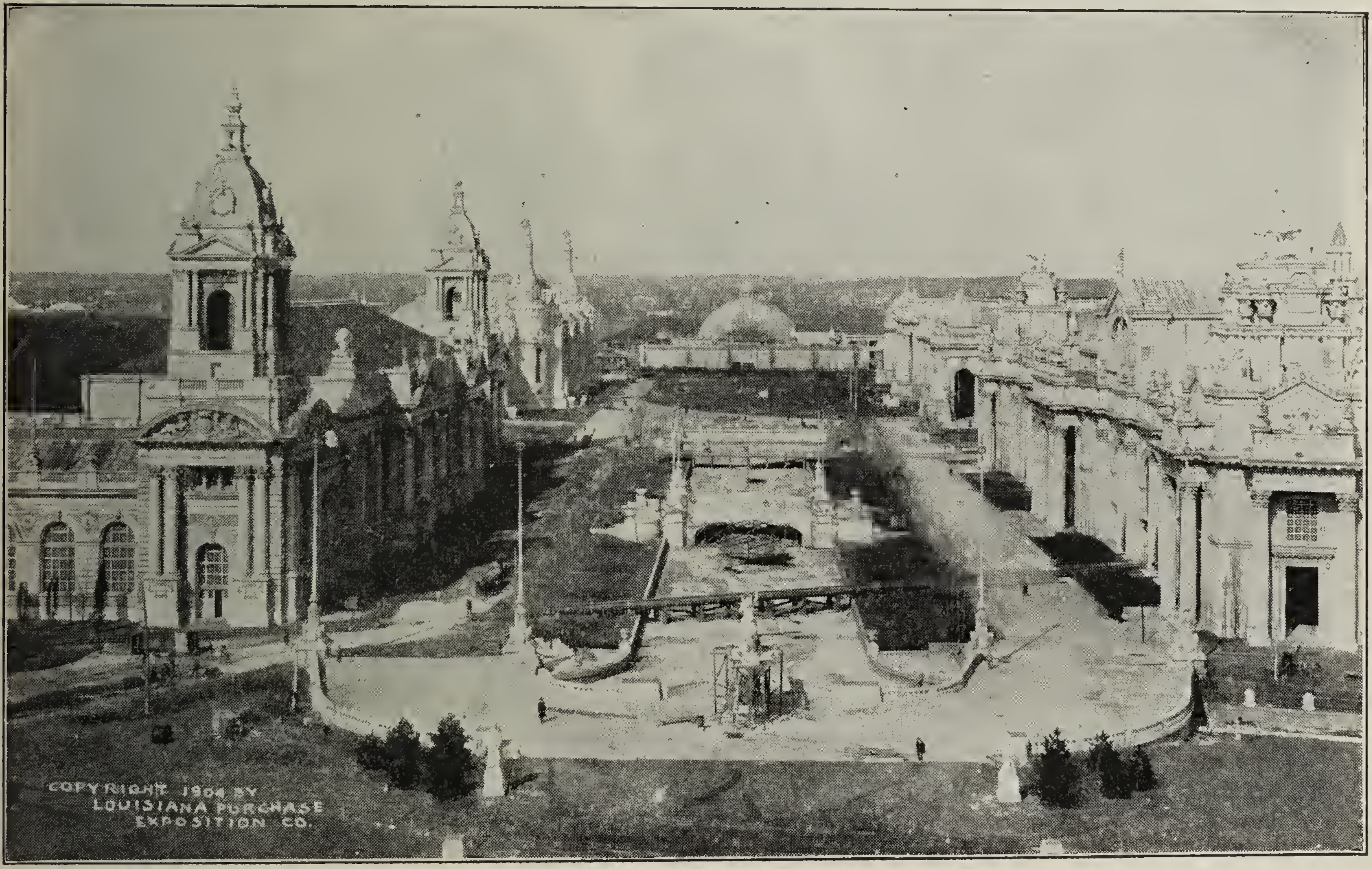
"Oh, I'd have to get a mason, of course."

"That's what I thought. Then you come along and propose to build a house out of stone that you make yourself, which you claim is as good as stone, and you talk about constructing it without skilled labor to save cost. Go to, sir, go chase yourself down the Pike, where there is a good brick pavement, and if your head don't get clear of this nonsense by the time you are half way down, you will find a foolish house there that you'd better take a session in."

"Oh, I don't know, sir," the Colonel said as he set down his empty stein, "I may build a concrete block house some dav but it won't be cheap, and for the present I'm going to stick to my brickyard, and that's what a lot of others had better do."

THINGS EMPLOYERS SHOULD THINK ABOUT.

When an accident occurs and personal injury or death results, the courts usually hold the employer liable for damages if it can be shown that a practicable appliance by which the accident could have been prevented was available. His failure to apply a recognized device is construed as culpable negligence. The owner or user of a boiler which exploded for want of a safety valve would have little chance of escaping the responsibility. What, then, of a man whose engine runs away for want of an automatic stop, whose steam main breaks for want of an expansion joint, and causes a lot of damage with steam that would have been retained by an automatic stop valve? If considerations of safety to plant and employers, continuity of operation, etc., are not sufficient to induce attention to these details, a wholesome fear of financial responsibility may be.—Exchange.



The World's Fair. Looking North from West Cascade.

The Mexico, Mo., Brick and Fireclay Company has been incorporated to manufacture all kinds of brick and tiling. The capital stock is $25,000, one-half paid up. The incorporators are W. W. Harper, J. A. Glover, W. K. Potts, A. G. Turner, W. W. Fry and others.

LIFE AT THE ST. LOUIS WORLD'S FAIR.

The Louisiana Purchase Exposition surpasses all others in life, color and motion—in the exemplification of processes and the demonstration of methods, as well as in the exhibition of products. What this means is explained by the familiar spectacle of a worried policeman keeping a passageway open through the sidewalk crowd that will stop to watch a man doing something in a window. Such awakenings of popular interest now abound in every department of this Exposition. The lace-maker, the weaver of delicate and beautiful fabrics, the glass-maker, the potter, the wood carver, the jeweler, the lapidary, the miner, the metallurgist, and artificers in many curious crafts from all parts of the world may be seen at work here satisfying the widespread curiosity as to how their finely wrought wares are made from clay, wood, stone, textile fibers, leather, ivory, metals, etc. The world's most improved and gigantic engines are seen here, not as still exhibits, but in action, furnishing the power to show all the latest and most improved mechanical devices at work. Here electricity can be seen doing its marvelous feats in all the modern fields of human activity; driving at once the most effective factory plants and the most delicate household machinery and providing currents for lighting and heating and for wireless telegraphy and telephony. The visitor can here see practical demonstrations of athletic training methods; the teaching of the blind, the deaf and dumb; laboratory work in actual practice, with complete apparatus, making liquified hydrogen, solidifying air and oxygen, separating helium from gas mixtures and illustrating the luminary wonders of the radium; complete plants illustrating the graphic arts, the making of pictures and books; hundreds of varieties of fish swimming in aquariums, and birds of every plumage living in an immense wire aviary. In the live stock shows, the many demonstrative features of the outdoor exhibits, the athletic games, the airship contests, the military camps and parades—in the concessions as well as in the exhibit departments—in every quarter of the Exposition Park of 1,240 acres, as well as in nearly a hundred buildings—there are exhibits of life and action of thrilling interest to all—*World's Fair Bulletin.*

Written for The Clay-Worker.

LACLEDE FIRE BRICK MANUFACTURING COMPANY.

Interesting Features of a Great St. Louis Clayworking Establishment Where a Warm Welcome Awaits Vistors During the World's Fair Season.

By George J. M. Ashby.

THE IMMENSE WORKS for the production of highly refractory products and for sewer pipe, etc., that was established by James Green at St. Louis, sixty years ago, will afford an extremely interesting object lesson to clayworkers, municipal and other engineers, especially gas engineers and every one interested in the manufacture of gas visiting this city and the world's Fair. The factory, which at one time was in the village of Cheltenham, is now in St. Louis, not because the factory has moved, but because the city itself has spread out and enveloped it. There is, however, plenty of open ground around, and the company's plant, taking in 140 acres, within one fence, would alone prevent an overbuilt appearance of the district, to say nothing of the effect upon the landscape of the River Des Peres, which winds through the plant.

New Office of the Laclede Fire Brick Manufacturing Company, St. Louis, Mo.

Perhaps the simplest way to state the importance of an enterprise of this kind is at once to give two facts: That about five hundred hands are employed, and that last year over eighty thousand (80,000) tons of fire brick, sewer pipe, fireproofing, gas retorts, paving bricks, etc., were manufactured.

Starting from down town on a street car of the Suburban Company's line, the visitor is landed in front of the handsome office building recently erected by the company, the finest building for this purpose that I have yet seen. Here he will find that there are three factories within the one fence, making up the whole extensive plant of the Laclede Fire Brick Manufacturing Company. Application for permission to visit the plant has, as a matter of course, to be made. This permission is freely and very courteously granted to any one who is really interested in the work. I may say that my own experience is that there is a marked difference in this respect in the broader mindedness of our western manufacturers as compared with many of the manufacturers of the East.

No. 1 factory is a three-story building, in which sewer pipe, fire brick and refractory pieces of many kinds are made. At the time of my visit some huge grate bars weighing 160 pounds each were on the drying floor. These were intended for a garbage reduction plant that is being put up by the Dixon Garbage Crematory Company, of Toledo, Ohio. Other pieces were locomotive firebox tiles, for fire bridges, measuring 36x9x4 inches and weighing from 60 to 150 pounds. The second floor is mostly for all the smaller work connected with gas plants.

On the first floor of No. 1 factory, we find two dry presses at work. These are the well-known Chisholm, Boyd & White presses. They have been working here for a number of years, and, as a matter of course, giving perfect satisfaction. The Laclede Fire Brick Manufacturing Company is a pioneer in the use of the dry press for making fire bricks. We all know what a long enduring prejudice there was against the dry pressed brick for building purposes. Considerable prejudice had to be overcome in respect to the dry pressed fire brick, though the principal or only objection to the dry pressed building brick—its being more porous than a mud brick—should have been the strongest point in its favor as a fire brick. There is no longer any prejudice against dry pressed brick, whether for building or fire brick. Indeed, the dry pressed fire brick is said to be superior in many cases to the slop moulded brick and to be more refractory on account of its physical character.

The sewer pipe for which, too, the company is so well known, is too familiar a subject to the readers of The Clay-Worker to need much comment. The company makes thoroughly good sound pipes, in sizes up to 24 inches diameter. The sewer pipe presses are both 48-inch steam cylinders, and have been in operation for quite a number of years—so many, that Superintendent Talbot could not remember how long they had been running.

The clay preparing machines are of the usual kind. There are five 9-foot pans, three dry and two wet. There is something noticeable about these pans. In the first place, they are made by the company in its own machine shop, right here, and the wet pans have an arrangement, patented by one of the officers of the company, for the automatic emptying of the pan. The paving bricks or blocks are made on American Clay-Working Machinery Company machines and repressed on three "Eagle" represses. Two Bucyrus pug mills are also used.

THE CLAY.

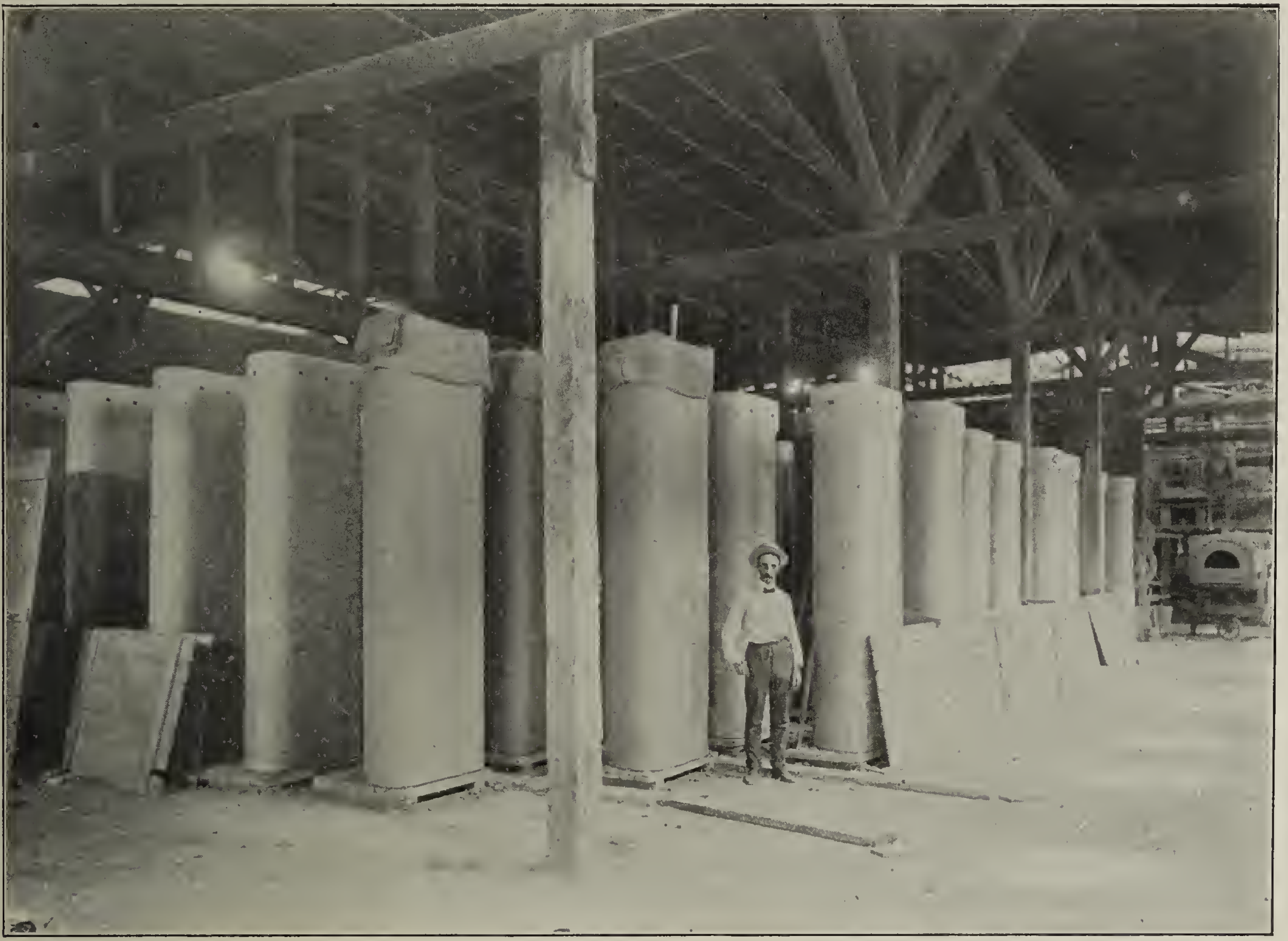
This important factor in a clayworking establishment is very well provided for by two clay mines owned by the company on the property itself, and two others at a short distance. Besides the product of these four mines, a highly refractory clay is brought from a comparatively short distance within the State of Missouri. This is called a flint clay. When used alone, it burns white. Its analysis shows that it has the constituents and proportions of a kaolin, though its physical condition is different from ordinary kaolin. The clays mined on the plant are plastic. They burn at Seger cone 19, or about 3,000 degrees Fahr. The so-called flint clay has a much higher degree of refractoriness. A shale clay is used for the sewer pipe and paving brick. This contains a considerable quantity of iron, some of it in the form of sulphide.

BURNING.

Thirty-nine kilns are in use. Of these fifteen are round, the others are square. The round kilns are from 26 to 30 feet in diameter, with the usual furnaces and bags and the ordinary perforated floors. The sizes of the square kilns are 60x23 feet, and 80x23 feet. These have furnaces along the whole length on each side and continuous bag walls inside. The water smoking in both round and square kilns takes about three days, depending upon what kind of ware is being burned. If the pieces are large, the water smoking is slower and takes longer. Full fire is from 10 to 16 hours. For the glazed ware the salting is then done and the kiln is shut for about four days. Coal is used throughout for the water smoking and burning and the same kind of coal for both purposes, this is, an Illinois bituminous coal.

WASTE HEAT.

Six of the large square kilns are fitted with a simple arrangement for taking off and utilizing the waste heat from the burning and cooling off of kilns. Two large tunnel flues run the length of the kiln on each side below the furnaces. These two flues connect with a cross tunnel running below the ground at one end of the kiln, in fact, crossing the end of all the kilns. An 11-foot fan draws heated air out of the kilns and forces it into the tunnel dryer. This fan takes about 50 horse power. The whole arrangement is the New York Blower Company's system.



Gas Retorts in Drying Room. To the Right is a Retort Still in the Mould.

A description of Factory No. 2 and Factory No. 3 would be nearly a repetition of No. 1, except that there are no dry presses in either of these. Each factory has its own power plant and boilers. The boilers for No. 1 have a capacity of 600 horse power. Those for No. 2 of 500 horse power, and for No. 3 the boilers are of 250 horse power. The engines used are of capacities from 500 horse power down.

THE MACHINE SHOP.

A machine shop plays quite an important part in the work, not only for all the repairs, but, as mentioned above, for making some of the new machines, such as dry pans. In the machine shop we find a lathe with 48-inch gap, and other smaller lathes; a boring mill in which a 12-foot wheel can be turned; a drill press; a machine for surfacing liners of dry press moulds; planer; shaper; emery wheel, etc. Next to the machine shop is the smithy, with two forges, and blowers, instead of the old-fashioned hand-driven bellows.

THE COMPANY'S MANUFACTURES.

The Laclede Fire Brick Manufacturing Company is the largest independent producer in the world of hollow tile for fireproofing. During the year 1903 it furnished the fireproofing for the great steel construction buildings in this city, the Frisco building, the building for the St. Louis *Star,* the Jefferson Hotel, the Fine Arts building at the World's Fair, and a number of smaller contracts, requiring in all over 12,000 tons of this class of material for partitions and floor arches.

In this place it may be stated that the claim is advanced for the Laclede fireproofing that it offers a higher resistance to fire than any other material, as it is made from the same kind of clay as the Laclede fire brick, and it is about 50 per cent. lighter in weight than the thick, porous tile. It is said to be much easier to handle, and it can, of course, be shipped more advantageously by rail.

Sewer pipe is an important branch of the work, and 10,000 tons of pipes were turned out last year.

Fire bricks, for which there is a capacity of 30,000,000 annually, and of which the output last year was about 12,000,000.

Paving bricks or blocks—these measure 8½x2¾x4 inches. Twelve million is the capacity. Also, vitrified blue checker tiles, 6x12x2½, for stables, sidewalks, etc.

Fireproofing, of which over 12,000 tons were manufactured last year, and for which the present capacity is 15,000 tons.

Gas retorts, 3,000; tile, 10,000 tons; sewer pipe, 10,000 tons; fire clay (dry milled), 5,000 tons.

Many kinds of vitrified clay products are manufactured, such as well tubing for bored wells, farm drain tiles, vitrified chemical rings, blocks and tiles for chemical towers, fire clay chimney pipe and flue linings, chimney tops, vitrified wall coping, and many other things. These goods are sent out to all parts of the world over the Missouri Pacific and the Frisco Rock Island systems. The eight miles of private tracks and switches give the company unsurpassable facilities for handling the annual shipment of 5,000 cars.

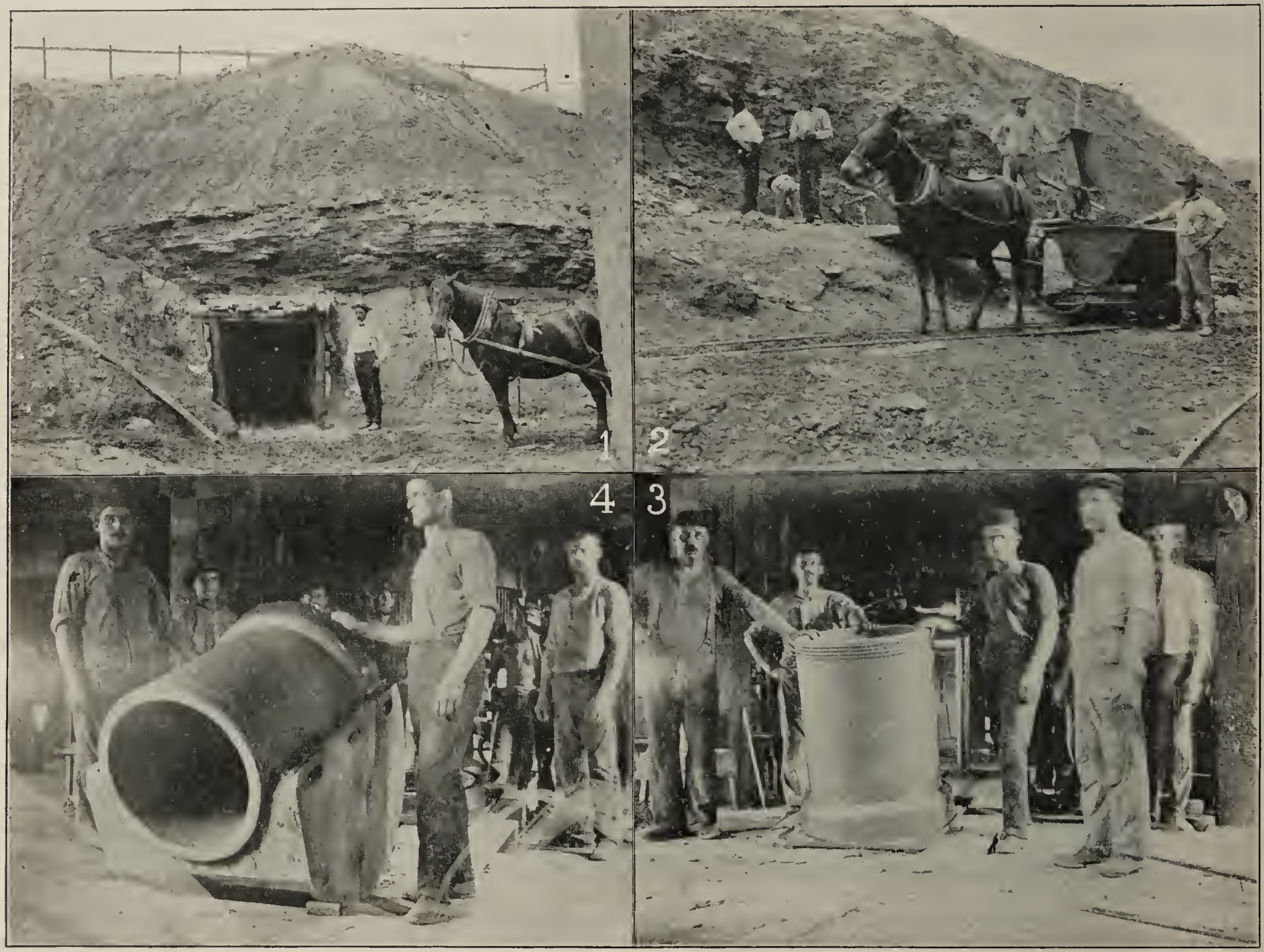
GRADES OF FIRE BRICK.

The various grades of fire brick are in Standard 9-inch and special shapes. They are branded "Laclede, St. Louis," "Laclede XXX," "Laclede Crown," "Laclede Climax." "Laclede St. Louis" is a fire brick made from the celebrated Cheltenham clay, and is employed principally for coal gas furnaces, boiler settings, coke ovens, bake ovens, kilns, smokestack linings, etc., where a temperature of not over 2,800 to 3,000 degrees Fahr. is met with. The price of this grade is about $16.00 per 1,000.

"Laclede XXX" is made especially to withstand abrasion in furnaces and kilns where a temperature of 3,000 degrees is encountered. This is priced at $20.

"Laclede Crown" is manufactured from a high grade of refractory clay, combined with Cheltenham clay, to give it a good bond. This makes a tough and refractory brick for use in puddling, heating, blast and other furnaces, where great expansion and contraction occur. It is also extensively used for gas bench fittings and water gas apparatus linings.

"Laclede Climax" is made from a pure and highest refractory clay. This is very rich in alumina. It is carefully selected or



In and About the Laclede Plants. (1) Mouth of Fire Clay Mine. (2) The Shale Bank. (3 and 4) Making 36-Inch Pipe.

picked so as to be free from iron or other impurities, and is then calcined before it is ground. The "Climax" is recommended where the highest heats are necessary and scouring, basic slag has to be dealt with. Both the "Crown" and the "Climax" brands have been found very useful for oil burning furnaces, and many of the largest power houses in the Southwest burning fuel oil are using these brands with most satisfactory results.

"Laclede Basic." This fire brick is extremely high in alumina, running over 80 per cent., and comparative tests have proved its superiority to both the domestic and the Grecian magnesite brick for open hearth steel furnaces and smelters, where the most extreme heats are carried and a scouring, basic slag is present, which destroys the ordinary high-grade refractories almost instantly.

In addition to the regular shapes, square edge tile and shapes to conform to drawings submitted for special requirements are made with any of the materials of any of the above brands, according to the heats to be carried, and the thermo-chemical reactions they have to be subjected to in the presence of certain slags and gases.

The Main Office

THE GAS RETORTS.

I have so often written about the manufacture of sewer pipe, paving brick, fire brick and the other ordinary clay products, that it is difficult to find anything novel in the subject, but the manufacture of gas retorts was quite interesting and less familiar. The production of gas retorts forms one of the most important branches of the Laclede Company's business, and a system of gas retorts which is revolutionizing the coal gas manufacture of this country was introduced here by Mr. James Green, the president of the the Laclede Fire Brick Manufacturing Company, who, after testing the system for two years, bought the patents for the United States.

Two photographs which I took show, the one a retort in process of being made, the other a number of retorts that are drying. In the latter picture Superintendent Fred. Talbot, standing near one of the retorts, gives an idea of its size. In the first photograph one man was caught in the act of ramming the clay while another is pouring in the wet clay from a pail. Four men form the gang, two rammers, one man to tend the mill and one to feed the material into the mold for the rammers. The man who pours in the clay also uses the rammer and very effectively, too, for he is more than ordinarily muscular. The other two men did not happen to be in sight at the moment of taking the photograph. These gas retorts are from 9 feet 6 inches to 10 feet 6 inches long, but the core around which the retort is built or moulded is not more than a third of this length. One of these cores is seen on the right of the mould at which the men are working. It is standing on a base, ready for the outer shell to be put in place. It will be seen that the core has a rod fastened to it, which rod is attached to a hoisting arrangement, so that when the lower end of the retort is formed the core is pulled up sufficiently to do the moulding, or ramming, further up. It will be noticed that the hoisting rod is in four sections, so that as the core is pulled up the rod is shortened. The core is made of wood, covered with sheet bronze. When the moulding of the retort is finished, a truck of special design is run up to it, it is tilted over and wheeled away to the drying shed, where the shell or mould is unlocked or removed. The retort remains for three weeks or more, according to the weather, to dry, before it is put in the kiln. A kiln will hold 80 retorts of this size, and the gang of four men turn out four retorts per day. Four gangs are usually at work all the time. I was surprised to find that the price of the complete retort is only $18.00. In addition to this it is guaranteed for two years. The life of a gas retort is usually four years. The weight of the retort when burned is from 2,000 to 2,300 pounds.

The Lawn Decoration in Front of the Factory Office.

In addition to the retorts made in one piece, there are the "inclined retorts" that are used in the newest and most improved system of gas making. These are from eighteen to twenty-two feet long, and are made in three sections, in the same manner as above described. Each section weighs about 1,800 pounds, and the price per section is $18.00. It seems to me that gas companies could very well afford to pay more than this, and, as a consumer of gas, who feels that he is robbed most of the time and sometimes insulted in addition, I am sorry that the clay man is not able to squeeze more out of the gas man.

The splendid exhibit made by the Laclede Fire Brick Manufacturing Company in the Palace of Manufactures at the Louisiana Purchase Exposition shows two complete gas making plants. A description of the process of making gas from coal by means of these plants was prepared for The Clay-Worker by Mr. J. Munhall King, the secretary of the company, and handed to me with the permission to work it into my story, but it is too interesting and too well written to make any change in it, so, although there are no quotation marks, it is given in Mr. King's own words.

GAS MAKING PLANT AT WORLD'S FAIR.

The main object of the promoters of the great Louisiana Purchase Exposition was to make the educational features surpass those of any previous exposition and this objective has been attained with gratifying results. Whilst the majority of the exhibits are simply the products of many and varied manufacturers giving no details concerning the process of manufacture, there are many working exhibits showing in detail the various processes of manufacture from the crude material to the finished and merchantable product, but in many instances the exhibits are complete and comprehensive without that additional feature which would mark them as working exhibits. In the latter class is the exhibit of the Laclede Fire Brick Manufacturing Company of St. Louis.

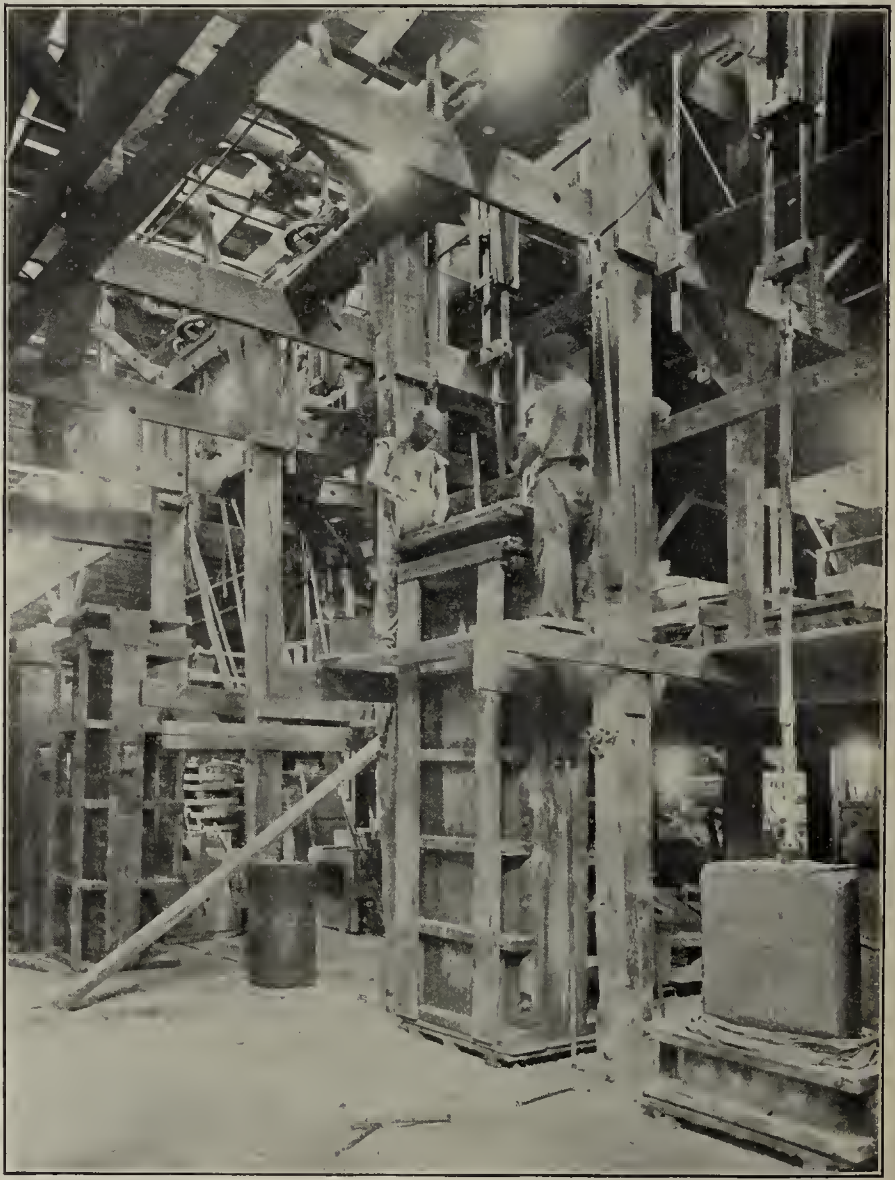
Probably every man woman and child visiting the Exposition is directly or indirectly a consumer of illuminating gas, but not one in a hundred is acquainted with the process of manufacture. This is not strange for the reason that as a rule there is only one gas plant in a given locality and the works are not usually such as are inviting to the student or the curious. Yet there are few more interesting, useful or profitable industries and as an educational feature in this particular field the exhibit of the Laclede Fire Brick Manufacturing Company excels any previous attempt to show in detail the manufacture of illuminating coal gas. At an expense of thousands of dollars they have installed what in trade parlance are known as one Coze bench of inclined 9s and one bench of horizontal 6s, all with bench mountings, hydraulic mains complete. The bench of 9s has nine inclined retorts, each being 20 feet in length with a mouthpiece 18 x 28. Each retort will carbonize 6,000 pounds of coal in 24 hours producing 30,000 cubic feet of gas, or the nine retorts would carbonize 54,000 pounds of coal producing 270,000 cubic feet of gas in 24 hours. This would supply a city of about 50,000 inhabitants. In addition to the gas the bench would produce the following by-products: 6,600 tons coke, 116,640 gallons tar and 145,800 gallons ammoniacal liquor.

The bench of 6s has 6 retorts, each being 9' 3" in length with 15 x 26 mouthpiece. Each retort will carbonize 2,400 pounds of coal in 24 hours producing 11,000 cubic feet of gas, or the 6 retorts would carbonize 14,400 pounds of coal, producing 66,000 cubic feet of gas in 24 hours. This would supply a city of 30,000 inhabitants. In addition to the gas the bench would produce each year the following by-products: 1,800 tons coke, 31,500 gallons tar, 39,500 gallons ammoniacal liquor.

NOONDAY LUNCH.

When I visited the works with my camera and note book a few mornings ago I had notified my appetite to control itself until late in the day so that I was not a little surprised at noon to be invited to lunch in the office, but was still more surprised to be conducted to a dining room for the use of the staff. A table was set, perfectly complete in all its appointments and fifteen of us sat down to dinner, including the vice president, the secretary and the superintendent. The menu was soup, two kinds of meat, three vegetables, dessert and tea or coffee. A colored man waited at the table and I learned afterwards that the cook is a white woman who has quite a reputation as a "culinary artist" and is often called upon by West End residents to give her aid in the preparation of elaborate suppers. The member of the staff taking meals here pays 15 cents per meal. No one needs to take a meal here unless he pleases, but no one cares to forego the privilege of getting such a meal for 15 cents. The company loses about a hundred dollars a month by the deal, but it is perfectly satisfied to do this and does not begrudge the money. This staff dinner is an institution now and has been running for a little over two years.

I enjoyed that dinner very thoroughly, not only because of its solid excellence, but for the cordial welcome that went with it and Mr. King tells me that World's Fair visitors who go to the great plant at the corner of Manchester and Sulphur avenues will find at noontime a place at the board and a hearty welcome to spice the meal and *no tips are allowed.* I may mention that on the second floor a large and comfortably furnished room has been prepared for the convenience of World's Fair visitors, where they can rest, or do their correspondence. Visitors going to the plant direct from the Fair should leave the grounds by the Inside Inn gate, from which it is but a ten-minute walk to the factory.



Moulding Gas Retorts.

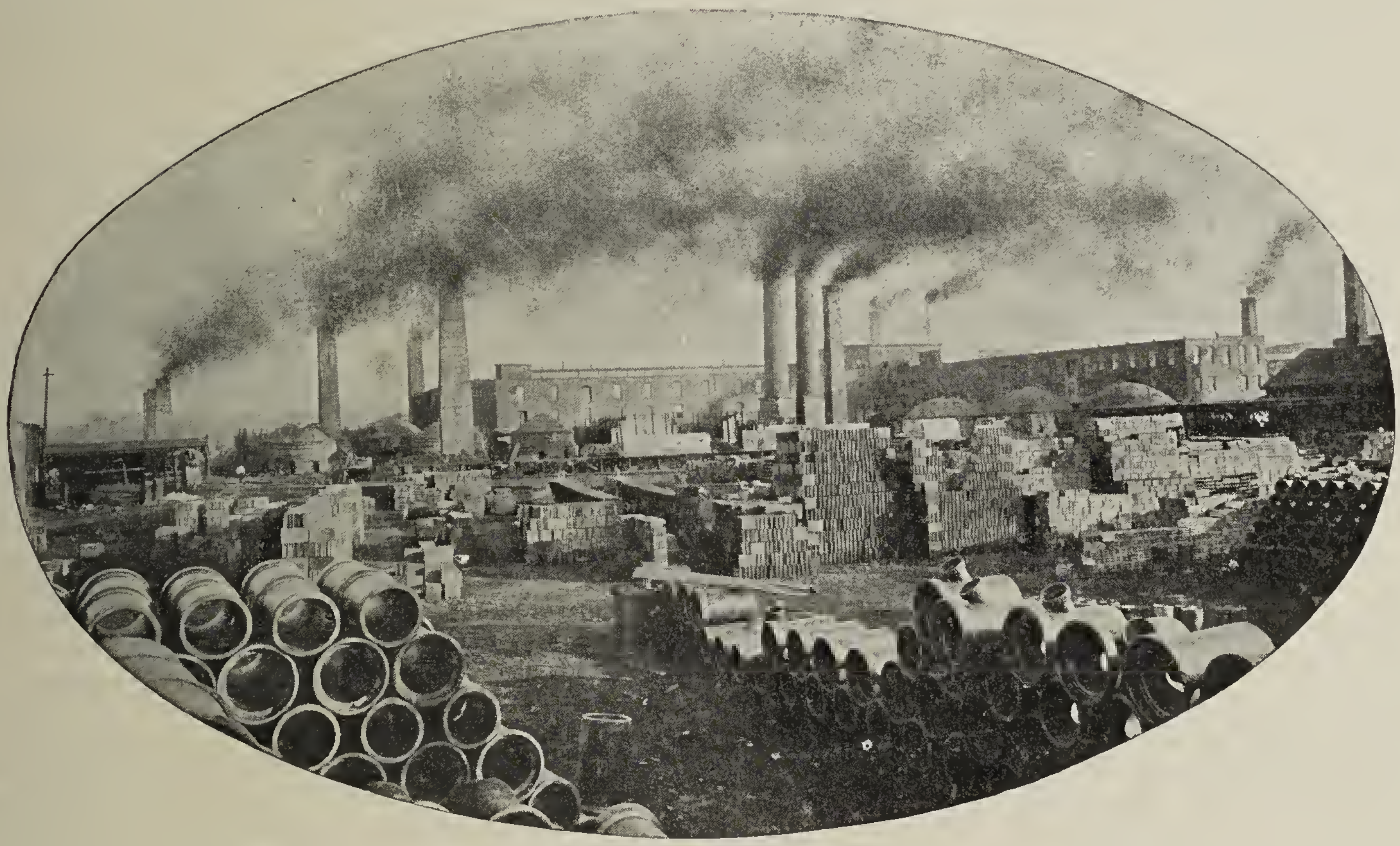
Anyone who has got through this story will feel more interest in the men who have made the enterprise such a great success than if I had started out with a reference to them. First is the president, Mr. James Green. He was born in Staffordshire, the great clayworking center of England, in 1829, and came to this country, not as the traditional poor boy of romance, with 50 cents for his fortune, but as a man of 23, with some capital, a business training and thorough knowledge of a trade. He was first connected with rolling mills in the East and later came to St. Louis, where for a number of years he was connected with the Laclede Rolling Mills. In 1865 Mr. Green took up clay manufacturing and bought the concern, which in 1869 was incorporated as the Laclede Fire Brick Manufacturing Company. Mr. Green has always since then held control and is president of the concern. He is an extraordinary worker, taking an active interest to-day, not only in his own plant, but in other enterprises. He is a director of the Mechanics' National Bank, of the Commonwealth Trust and of the Kinloch Telephone Company, in which he has a large interest. (The Kinloch is the telephone company whose excellent organization and very useful competition has kept the Bell company on its best behavior in this city.) Mr. Green is identified with many other industrial and commercial undertakings and is, in the best sense of the phrase, one of our leading citizens.

Mr. J. L. Green, son of the president, is vice-president. He is American born, has enjoyed the advantage of the highest American education and training, and is devoted to the clay works to which he gives his constant attention. Mr. J. Munhall King is secretary.

Mr. Fred Talbot, who has been superintendent for nearly two years, took service with the company in a much lower capacity seventeen years ago. Mr. Talbot is of English origin, but was brought here at such an early age, that he has "grown up with the country," and is thoroughly American in manner and hustle.

A PROSPEROUS NEW JERSEY TERRA COTTA PLANT.

Work at the Atlantic Terra Cotta Works, Tottenville, N. J., is much better than it was several weeks ago. Several gratifying orders have been received recently and there is no prospect of an immediate cessation in the present rush. The company's largest contract is for the work being done on the new Union Station at Washington, D. C., for the Pennsylvania railroad. It will be one of the representative railroad stations of the country, and will cost nearly $3,000,000. It will be finished inside and out with white glazed ornamental terra cotta.



The Laclede Fire Brick Manufacturing Company's Plant No. 1. Plants Nos. 2 and 3, Located on Either Side of No. 1 Are Very Similar in Appearance.

The lowering of the cost of production at the Atlantic plant has been facilitated by the installation of a new system of utilizing waste, heat to dry the pressed terra cotta, and also to heat the building in cold weather. There will soon be installed a new-design powerful turbine engine in the main room, and new grit mills are also being put in. Electricity is also being made greater use of, and traveling electric cranes and also motors and fans are being constantly installed.

It is an old saying among sculptors that bronze is immortality, marble is death, and clay is life.

Written for THE CLAY-WORKER.

CAPITAL BRICK AND BUILDING NEWS.

IF SOME SMART inventor would bring out a road machine that would draw easily and quickly a brick train, Washington, D. C., might now offer a profitable field for its work. Building is going on here quite extensively, and the brickmaker is very busy; but the hauling problem is the chief disturber of the peace—of mind. Prices of material have had their share in the latter particular—and still have—but in spite of this, business is moving right along. Another setback has been slowness of the D. C. office in issuing permits, insufficient help—notwithstanding the fact that the last appropriation for the District was over $11,000,000—being given as cause for the delay. It seems impossible to get money enough to run this municipality. Like the Scriptural daughter of the horse-leach, the cry is continually "Give, give!" If Congress were to cease appropriating for the District, the latter would become a howling wilderness—the overtaxed citizens would do the howling, and pretty soon do the getting out.

Washington is undoubtedly, as called, a "government city," and the Government's building business is having much influence on industrial affairs in this connection. One reason is that the Government contractor usually pays more for work than the private enterprise. An example of this is seen in the difficulty of many builders to get brick hauled for private structures, while the contractor with the Government, paying more for teams, secures them. Most of the brick used in the District come from Virginia, just across the Potomac river, and the haul is expensive for the brickmaker and often trying for the builder. As remarked above, a road hauling machine, if practicable, is needed.

The report of the District building inspector for the month of June, 1904, shows there has been a material increase in building operations as compared with the corresponding month one year ago. This decrease is noted in both the number and the aggregate cost of brick and frame dwelling houses, in stores and other structures. In some cases this decrease is striking, as in the instance of apartment houses, for which only one permit was issued last June, as against eleven issued in June of last year. The one apartment house cost $22,000, the eleven

$838,000. The total value of buildings and repairs for which permits were issued last June was $1,312,041, against $1,904,868 for that month of the previous year. However, it is believed that this year's building business will foot up in fine shape.

BRICKLAYERS' UNION DRAWS COLOR LINE.

The striking fever has just had a little bat at Uncle Sam. The bricklayers on the War College, in Washington, struck—on the color line and union principle. It was a small strike—only twenty-eight workers—but the men quit with a sudden break-off snap—when they saw a sable nonunion bricklayer climb to the wall—that made the engineer in charge come out and investigate matters. He found work going on only in one spot—where the man of color was plying his trowel—a solitary citizen, all by himself, building a great edifice.

When asked by Captain Sewell, the engineer in charge of the work, if the color question did not have something to do with the strike, one of the strikers said that that might be one reason. Another striker said the negro was not a union man, and union law forbade working with "scabs."

A UNITED STATES ENGINEER DRAWS THE CONSTITUTION.

Captain Sewell said, in regard to this strike: "I don't propose to let this matter conflict with the laws of the United States. The committee of bricklayers informed me that the rules of their union would not permit them to work with 'scabs.' I thereupon advised them to have their rules changed, so far as they relate to Government work, as it would be far easier to amend their regulations than it would be to amend the Constitution and laws of the United States. I explained to them that as the case stood there were the laws of the United States on one side and the rules and regulations of a labor union on the other. I also informed the committee that we could not, under the very Constitution, discriminate against any man, all things being equal, because of his race, color or preivous condition of servitude, and I can say the colored man who is alone at work to-day is a good mechanic."

And that is the way the man of war fired the Constitution at the strike.

The men employed on this work have an eight-hour working day with maximum pay, and seven holidays a year with full pay for each. But to understand this matter better (it is of interest to bricklayers and others), it may be stated that these workmen are "registered" employes of the Government, not in the classified service nor eligible for that service by promotion. The Civil Service (War Department) regulations in this particular are, in main part, as follows:

"Registered positions include all positions pertaining to the mechanical trades, all positions requiring skilled labor of any kind, all positions where training and experience in the particular duties to be performed are of more value than theoretical or technical education, and all low-grade technical or clerical positions. * * *

"In reducing his force an officer will use his discretion as to who shall be retained and who temporarily or permanently separated. A furlough without pay from a position is an unqualified recommendation for re-employment on work of the same grade and renders the holder eligible for re-employmnt at any time within three years, which limitation does not apply to employes who have served during such period in the insular possessions. An employe who is 'laid off' is eligible for re-employment in the same engineer district for one year."

Examinations for ordinary registered positions include no educational tests, the applicant being rated upon the elements of age, intelligence and experience, character as a workman and physical qualifications.

From this it will be seen that the bricklayer—educated or not—can be in Government service; can also work outside of that service while still eligible for it, and can remain in his trade union.

The concrete and cement idea in building is making some progress in the District of Columbia. The sand-lime brick, though, is not in substantial evidence. There are a number of concrete and cement structures here built wholly or in part of these materials. Apparently such buildings are giving satisfaction, but they cannot offer surety guarantee that goes with brick. In this city one sees old brick houses which many years ago were coated with rough or smooth cement to give them a more finished or stone-like appearance. The end sought in this particular may have been attained—at first; but as years went on the cement coating began to peel off, giving the structure a ragged, unkempt look.

Americans got the concrete, cement, etc., idea from the Spaniards, who took the quick, easy way of "slinging together" structures, availing themselves of the first usable material at hand. Evidences of this are seen on the Atlantic and Pacific coasts, in the West Indies, Guam, the Philippines and elsewhere. Coquina, the shell-lime composition, was largely used by the Spanish. Of course, many such buildings last wonderfully long, but their war with the elements is attested by numerous scars.

It may be said of the clay brick, that it is not an imitation of anything. Its composite elements, like iron ore, being subjected to intense heat, come from the kiln a hard, almost indestructable product.

Many tons of concrete have been used in making the foundations of the Union Railroad Station in Washington, and an immense quantity of this material is going into the new filtering plant located at the north end of North Capitol street. The methods employed in using concrete in the works mentioned involves the use of much machinery—engines, derricks, cables, tramways, lifting and carrying buckets, molds, etc.—and expense.

The filtering plant will cost $3,000,000; its make-up will be principally of concrete, with, for roofing, iron binding rods embedded therein, but a great deal of terra cotta pipe will be employed in the filtering process.

The great filter, when completed, will consist of twenty-nine one-acre chamber beds, each bed capable of filtering 3,000,000 gallons per day. Through the center of each chamber and beneath the floor, run large mains leading to the clear-water reservoir. These mains have openings every fourteen feet through the floor of the filter. On top of the floor there will be laid at right angles to the mains below sections of terra cotta pipe with wide interstices at the joints. These will be covered with gravel, and over all a medium grade of sand will be spread to a depth of four feet. A large pumping plant will supply the filter water from a storage reservoir in the near neighborhood.

Nicodemus.

THE CHICAGO SITUATION.

Building activity here continues to be fairly brisk and the total business in this line thus far this year is greater by a considerable volume than has been undertaken in the corresponding seven months for five years. The increase in number of building permits for July 1904 stands at 644 as against 550 for July 1903, and the total estimated cost of the structures for these periods stands in the records $763,000 in favor of the month just closed.

Nearly all the dealers in brick and terra cotta here are busy figuring on jobs to be started shortly in and about Chicago. The real estate market is brisk and the general confidence which pervades the public mind and which is responsible for the present hopeful condition is probably due in a measure to the absence of labor disputes—except in "Packing Town"—and the fact that the coming election decided in either way will not affect the money market at least immediately.

Among the larger jobs being figured is an office building to be erected at 175-77 Jackson boulevard which is being planned by D. H. Burnham & Co., for David Mayer. It will be 14 stories in height; the exterior finish will be in terra cotta and pressed brick, and the cost is estimated at $450,000. Other structures varying in cost from one hundred, to three hundred thousand dollars, are under consideration and planned in large numbers, but the contracts have not been let as yet.

Scrip.

Written for THE CLAY-WORKER.

KANSAS CITY BRICK AND BUILDING NEWS.

THERE HAS been a number of conditions in this part of the country to discourage building, besides the generally offered excuse that it is a Presidential year. Locally, the flood of July 8th, coming a little over a year after the big flood of 1903, discouraged those who had been figuring on erecting buildings in either the "east bottoms" or "west bottoms," the parts of the city in which most of the manufacturing plants are now located. Those who have not already started their buildings seem to be figuring on new locations, even where they had already purchased sites for their proposed plants. This will likely cause a good deal of delay in that class of building and may delay some of the enterprises for an entire season, but a good many of them are now figuring on sites along the Blue River, east of the city, where there is plenty of switch property that is high and dry above all floods. One wagon factory which had already figured enough on a plant in the East bottoms to buy the ground, has about decided to change the plans and go to this better and higher site on the Blue.

In the long run there will be little difference in the building, as this switch property lying east of the city was bound to be used for this purpose, but it is now apparent that this section will be filled up before the remaining blanks are filled in either the "east bottoms" or the "west bottoms," when real estate men had been figuring on the Blue River property waiting until both the other manufacturing districts were pretty well filled. It is pretty generally acknowledged now that some dykes will have to be built, or some other flood protection movement made before confidence will again be restored in these older and better known manufacturing districts. Another plant moving to the Blue Valley is a large boiler factory, but their new plant will not require a great many brick, as the property purchased was the old bolt and nut works, and all the foundry department will make use of the brick walls already standing.

After the flood there was a strike declared by the packing house employes, and while the packers seem to be getting along pretty well without the strikers, having now reached the point where they are again running at about full capacity, the strike has been felt by all other lines of business, and has stopped a good deal of building which was contemplated, and the end is not yet, the business men fear.

The conditions in the surrounding country have been rather bad this year, there having been so much rain that the bottom lands were all flooded three separate and distinct times, and that has held back all kinds of building which had not already been started. The present crop outlook is much improved, however. The rains of early July did not do nearly the damage to the wheat crop that was expected, and wheat now arriving in this city is of pretty good quality, and is coming in quite rapidly. The corn crop is reported good in most of the surrounding territory except a considerable strip along the Missouri-Kansas line, where the crop will be very spotted, even with the best of growing weather for the balance of the season.

When these conditions are considered, both in and outside of the city, it certainly looks well when we find that the value of permits taken out from the office of the inspector of buildings during the month of July was $40,655 more than for the same month of last year, the total number of permits was 389, and the total amount $869,545, while of this total there was $364,150 in permits for fifty-six brick buildings.

In the past year there has been a great number of apartment houses built here, and while there was a crying demand for them when this building was begun, it would now appear there are plenty of them to supply all demands, if not too many.

Brick men are of the opinion that the fall season will not be very brisk, owing to the fact that there are so few orders being booked at the present time. They say the various conditions have caused a good many investors to postpone their building for another year, and this condition will be felt a little later. At the present time the plants are most of them busy making deliveries of goods that were sold long ago, for the advance sales were very large this spring where the management of the plants did the proper hustling.

There has been no change in the price of brick, to amount to anything. The season opened here this year with a low price, and the figure has remained the same.

The other day the city accepted bids for asphalt street paving to the amount of $22,616.45. and brick paving to the amount of $547.20. This is a fair sample of the way the asphalt and brick contracts are averaging here, and seems to show quite conclusively that the asphalt trust is not in business here for its health, but wants about everything in sight.

Walter S. Dickey, of the Walter S. Dickey Clay Mfg. Co., seems to be pretty close to the hearts of the Missouri Republicans, judging from the manner in which he was able to get the St. Joseph convention to go his way. He remarked when he came back from Chicago about a month ago, after the National Convention, that he was going to make sewer pipe now. It seems, however, that he is still carrying a pretty good stock of politics as a side line, but his is the clean brand, so it is not a burden to him.

The penitentiary brick plant, maintained by the State of Kansas, at Lansing, is furnishing the brick for several short strips of road lying between the various public institutions and the nearest cities. It was not the object of this plant to furnish brick for making pavements for all the roads of the State, but to show what a good road would do for a community, and it is likely the showing already made will be a good object lesson. It is understood the counties are going to take up the matter where roads have already been built, and will extend them to other points. This should be a good move for brick men, as in the Kansas gas belt brick can be made at a price which would not be so extremely expensive for country roads, and a local demand of such proportions would do much to keep the surplus of brick out of the road in the gas field, where it is looked forward to, with considerable apprehension. All eastern Kansas needs paving with some kind of a pavement, and if brick can be used, there will never be any lack of demand, even though every gas town which is now looking for a brick plant manages to land a big one.

Charles W. Reed, of the Kansas City Hydraulic Pressed Brick Company, has just returned from a vacation trip, which was spent in visiting the World's Fair in St. Louis.

At its next meeting the city council of Rosedale probably will advertise for bids on the construction of a thirty-six inch brick sewer on Shawnee street, a fifty-four inch brick sewer on Wyandotte street, in that city, and a six foot sewer across the Frisco railroad's right of way. This sewer will lead from Wyandotte street to the east bank of Turkey creek. Permission to build such a sewer was received two weeks ago from officials of the Frisco system. The railway company also agreed to pay one-fifth of the cost of construction and to provide for the bracing of their tracks while the sewer is being built.

W. H. Mahan, the general manager of the Coffeyville Vitrified Brick and Tile Company, of Coffeyville, Kansas, is sick at the St. Joseph's Hospital in this city, having been brought here recently from Colorado Springs, Colo., by his son George H. Mahan. Mr. Mahan went to Colorado for his health, and as he was gradually getting worse it was thought best to get him closer home, and in a good hospital. He is suffering from a complication of diseases, and some of his doctors say Bright's disease. His son George is also in the brick business, having the management of the Sycamore plant of the Pittsburg Brick Co.

The Gump Pressed Brick Company has had the plant shut down almost a month, first owing to the rains putting the clay out of working order, and later because the farmers were so busy putting in their crops that they could not hire teams. They have plenty of brick ahead, however, and are filling orders promptly.

The Pittsburg Brick Company sustained a considerable loss at the Leavenworth, Kansas, plant during the last flood, the cloudburst in that vicinity having struck their plant while a couple of kilns were very hot.

The plant of the Coffeyville Vitrified Brick and Tile Company, which so narrowly escaped great damage from the flood mentioned in the last issue of THE CLAY-WORKER, only escaped for a short while, for the next flood inundated their plant pretty badly, destroying several kilns of green and burning brick.

LAND DRAINAGE

BY J. J. W. BILLINGSLEY

DRAINAGE OF FARM LANDS.

(By C. G. Elliott, Expert Drainage Engineer.)

Extract from Farmers Bulletin No. 187, Department of Agriculture:

Surveys and Grades.

Whatever may be said to the contrary, it remains a fact that in order to get the best results in a system of drainage the work should be laid out with a leveling instrument and executed in accordance with the survey made. No one can be relied upon to guess a grade correctly, nor can any one arrange a system of grades with economy and at the same time get the best possible work out of the system without first knowing the facts as determined by the level in the hands of one who is able to use it. The drainage engineer can stake out the lines, adjust the grades, and put the work in such shape that it can be executed with precision, either by contract or day labor. The results of the work can be predicted with reasonable certainty before a ditch is opened. The drainage engineer, with the aid of the farmer who is familiar with the soil, can plan and lay out the work to far greater advantage than the inexperienced man. The farmer or superintendent can then give his attention to the execution of the work and insist on having it done according to the plans and surveys without the misgiving that it may be entirely wrong. Where there are large tracts of level land, or of land so nearly level that it can be drained successfully only by the most accurate work with instruments, the services of an engineer are indispensable. Where the land is somewhat rolling, the farmer may be able to adjust the grades himself.

The slight grades upon which lines of tiles may be laid with satisfactory results are a surprise to many; indeed, they were regarded as entirely impracticable until the experience of recent years proved the contrary. Lines of drain tiles laid on a grade as low as one-half inch per 100 feet in firm soils will operate successfully, provided the lines are not too long, while drains laid on grades of one to two inches per 100 feet may be counted by the hundreds of miles, and their successful operation is attested by thousands of acres of cultivated lands. It is not difficult to impress upon the mind of anyone who will give the matter attention the fact that such work must be laid out with accuracy and executed with thoroughness and skill. It should be observed in this connection that the fact of a drain having a good grade should not be made an excuse for careless and inaccurate work, though it is conceded that the consequences would be less serious than where the grade is necessarily light. Where a grade can be adjusted as may be desired, three inches per 100 feet or one-half inch to the rod is regarded as ample for tile drains. The increase of the size of the drain as the grade is diminished is a principle that should be kept in mind in laying out work, since grades must be largely controlled by the natural slope of the land.

It is not intended here to convey the idea that drains can not be laid by guess by observing the flow of water or by the hand level, nor that apparently good work has not been done in this way; but numberless mistakes, involving great waste of labor, and failures in the attainment of the best results from the work, emphasize the wisdom of securing the best possible preliminary plans as well as their intelligent execution.

Size of Tiles to be Used.

The proper size of tiles to be used in the construction of drains is a matter upon which there is great difference of opinion, and accordingly of practice. It is doubtful if there is any part of the work requiring more careful consideration than this. Much difference of opinion on this subject arises from the fact that various soils respond differently to drainage work.

There are several questions to be considered in determining the sizes of tiles that should be used, especially for mains to a drainage system:

(1) What depth of water per acre will it be necessary to remove from the land in a given time, say twenty-four hours, in order to secure the desired condition of the soil?

(2) How rapidly will the water be brought to the main drains?

(3) What surface drainage does the tract have that will be available for carrying unusual rains?

(4) What is the nature of the soil as regards its drainage properties—that is, is it open or retentive?

(5) What are the grades upon which the drains must be laid?

As to the first question, it may be answered that there are times during the growing season when the entire ordinary rainfall will be taken up by the soil. At other times, when the rains are frequent and heavy and the soil becomes filled with water, it may be necessary to remove a large part of what falls in twenty-four hours. There are times when the rainfall is so heavy that the water can not pass through the soil fast enough, even if the drains are sufficiently large to carry it off, but a part must run off the surface, by its various depressions and channels, and these it is always wise to provide.

The total rainfall varies in the different States and sections quite materially. Drainage, however, has to deal with the extremes of rainfall rather than with the mean, when the size and efficiency of drains are considered, although it is generally true that the sections having the larger annual rainfall are subject to heavier storms. There are so many unforeseen conditions to be met with that to treat the problems in an analytical way in this connection will not contribute to any clearer understanding of the best practice now followed. Laboratory experiments made for determining the relation of rainfall to drainage are often so different from field conditions that they aid us but little in practical drainage problems. Deductions from the actual working of drains in lands of varied character and in different localities give us the most valuable data upon this point, and these have been the guides used in the following discussion.

If the main drains have a capacity to remove one-half inch in depth of water from the entire tract in twenty-four hours, they afford what may be regarded as good farm drainage, for, as ascertained by observation, even one-fourth or one-third inch in that time is the limit of capacity of many drainage systems in well-improved alluvial soils. The soil is a great reservoir and will hold from 25 to 40 per cent of its volume of water. In localities where no advantage can be taken of the surface flow for relief in times of heavy rainfall, mains may be used large enough to carry off one inch of water in twenty-four hours. Ordinarily for lateral drains no smaller than three-inch tile should be used.

PRACTICAL EXPERIENCE IN TILE DRAINAGE.

THE LATE Fulton Armstrong of Ohio was the owner of a 1,000-acre farm. He gave the writer the following brief outline of his experience years ago. He said: "My land is mostly level and needed drainage, when I commenced to farm it. I was $7,000 in debt, and had to choose one of two ways of farming—one of the ways was to take from the farm all that I could get and apply it on my indebtedness, and run down the fertility of my land, or the other way was to arrange to carry my indebtedness for a time and improve my farm, until the increased productions of it would pay off my indebtedness. I decided to do the latter, and as a foundation for better crops I commenced to underdrain. In the beginning of the work I employed an engineer and I am glad that I did. In the several years that I have been putting in tile drains the engineer has not cost me more than $100. I would not today be without the results of his work for $1,000. I have much work yet to do before my farm is thoroughly underdrained. I have every main and latteral staked out and the grade marked and require my men to work to the grade marks, and I have no failures in the working of my drains, and it economizes the cost more than enough to pay the expense of an engineer." We asked Mr. Armstrong how the yield of his crops on well drained land compared with those who did not underdrain. He said: "The most of our farmers in my neighborhood are tile draining their land, as fast as they have the means to do it, but my crops, compared with those who have not drained, are probably from 25 to 50 per cent. better than theirs. I have paid my indebtedness and have my land in much better condition than it was when I commenced to farm it."

ANOTHER EXAMPLE.

A. M. Wishmeyer of this county and state, a few years ago bought a tract of level land, clay soil and compact, in a neighborhood where there was much of such land. He bought it cheap, and having the money, he underdrained it, putting in parallel lines of drains 66 feet apart and from 3 to 5 feet deep. The work was well done. The neighbors shook their heads and prophesied evils in the way of droughts and a desert waste, but the "Dutchman" went on with his work and built a large barn which the neighbors said was foolishness—he could never grow enough in the way of crops to fill it—but their eyes began to open in two or three years, when he began to harvest immense crops. As an example: A neighbor whose land joined his who had done nothing in the way of draining and had made much ado about the "Dutchman's" waste of money, had a field alongside of Mr. Wishmeyer's cornfield that had a yield of only 30 bushels of inferior corn, and Mr. W. had a yield of 70 bushels, which was but a common thing when his crops were compared with those of the neighborhood.

Mr. Wishmeyer filled his barn and more, and became the most prosperous farmer in the neighborhood. His example had a good effect on his neighbors. They began to drain and have greatly improved their crop productions.

Written for THE CLAY-WORKER.

NORTHERN OHIO BRICK AND BUILDING NEWS.

ALL THE BRICK PLANTS are still running in spite of the fact that the usual dull summer season is on. The yards are filling up very rapidly, and it is very probable that some of the plants will be closed down within the next few weeks if there is not an improvement in the situation.

"The business for July was about the average," said William O. Dakin, secretary and treasurer of the Toledo Brick Supply Company, to THE CLAY-WORKER representative. "There is very little change, if any at all, in the general situation. These months are dull ones in our line, and the outlook for fall business is not at all promising. I see nothing in sight to show great fall activity. At present the large contracts are being finished up, while numerous small jobs have been completed. No big contracts are in sight. The prices have not changed since the drop of several weeks ago."

There is very little doing among Toledo architects. There are prospects for the erection of many new residences this fall, but it is a question of their materializing that seems to give the architects considerable worry.

Richard Kind, secretary of the National Builders' Supply Association, informed the representative for THE CLAY-WORKER that almost all classes of building material had taken a drop, that Portland cement alone had taken a drop of 40 per cent. "A comparison of present prices of building material with those of a year ago," said Secretary Kind, "indicates that building material is costing considerably less. In Toledo we are hampered by the present new building laws, and there is where the extra cost comes in. Lumber, brick, cement, sand, in fact, all classes of building material cost less than it did a year ago."

Irving Macomber, of A. E. Macomber & Co., brick manufacturers, said a few days ago that July business was some more than was expected, although the trade could have been much better.

A number of Toledo brick concerns have a stock of last season's brick still on their hands. One concern told THE CLAY-WORKER man the other day that they still had no less than 300,000 of last year's brick.

The contract for the New Elk building has been awarded to A. Bentley & Sons, their bid being $37,529, which is exclusive of heating and lighting apparatus, interior decorations and furnishings. The structure is to be completed by March 1st next, and the total cost is placed at $55,000.

Bentley & Sons also have the contract for the erection of the addition to the power plant of the Toledo Railways and Light Company. The building will cost $30,000 and will be done by October 1st.

Edward H. Huston has taken out a permit for the erection of a residence on River View to cost $10,000.

These three contracts are the only ones of importance which have come under the observation of your correspondent during the past four weeks.

The Toledo Cement Building Block Company is the name of a new concern which will erect a plant at the corner of Elm and Oneida streets, on the ground donated to it by the Toledo Railway and Terminal Company. The following are the officers: President, W. C. Shupp; secretary, J. A. Brownlee; treasurer, C. A. Jacquilliard. Other stockholders are R. E. Teets, W. E. Teets, Harry Tucker, of Toledo, and George Meek, of Fremont, Ohio.

A half-million dollars in street improvements in Toledo are under contract and legislation is still pending for more. The expenditure along this line is the heaviest it has been in the history of the city.

A large contract was recently awarded to Bodette & Shehan for the repaving of Lagrange street with unglazed Hocking Valley block, with Berea curb, at $63,811.20.

Garrigan Bros. will repave Canton street with five-inch Metropolitan block, with Medina curb, for $30,488.40.

Of about thirty-five contracts which have thus far been awarded for that many streets, a number have already been completed and almost all of the remainder have been started.

The Toledo Coal and Clay Company recently executed a mortgage of $350,000 for the purpose of enlarging its business. A number of improvements have been planned for the company's properties. At Cambridge, Ohio, a $50,000 brick and tile factory will be erected. In Michigan, where other plants are located, many big improvements will be made. The new company is an outgrowth from a consolidation of the Toledo Coal and Coke Company and the Fremont Coal and Mining Company. The officers are: President, Charles G. Hart, of Adrian, Mich.; Secretary, C. O. Mininger, of Toledo; Treasurer, Carey B. Close.

The new plant of the Fremont Pressed Brick and Manufacturing Company, at Fremont, Ohio, has been set in operation. The plant has a capacity for 20,000 bricks per day, and employs about fifteen men.

Michael Kiley, for many years a well-known paving contractor of Toledo, died July 24, aged 71 years. T. O. D.

HOT WEATHER PHILOSOPHY.

Good old summertime has come, but that is no reason why the producer and machinery manufacturer should lie down and say, "It's no use going after business; one half of our customers are out of town on their vacations." Just bear this in mind, that the half who are at home are there to make needed repairs or improvements and are likely to be in the market for all kinds of things. If your old customers are out of town go around and make new acquaintances and friends and extend your field of usefulness. The man who is hustling hard this hot weather is bringing in some good business.—*Rock Products.*

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Remedy for Cracked Brick.

Editor CLAY-WORKER:

I note by his letter in the July CLAY-WORKER that Mr. Zimmerman is having trouble, his brick cracking and checking in drying. The indications are that his clay is a tender clay that will not stand rapid drying such as would be induced by sun and wind. If his brick curl up very much the clay is probably too plastic and if it cracks very readily without much curling, is an indication that the clay does not contain enough clay substance to hold the mass together in a good bond. A little judicious experimenting in mixing his clays and sand in various proportions and drying slower will, in all probability, overcome Mr. Z.'s troubles.

X. Y.

Trouble from Cracking—How to Prevent It.

Editor CLAY-WORKER:

Replying to inquiry on page 731, CLAY-WORKER of June, 1904, Wm. Kailey of Southwest Nebraska says: "The bar of clay cracked at the corners as it came out of the die, we threw back nearly one-third of the brick and had to run the clay very soft to get any brick. When the car got hard enough to handle good, it would break in small pieces about four inches long, clear across the die, a side-cut die."

Here is probably a case, where the lubricating of the bar of clay was not managed right or may be there was no lubricating arrangement at all. When the bar is just stiff enough to handle good, and it cracks as described above, more steam ought to be turned on and the water pipe opened a little more to let the increased quantity of condensed steam out, and the bar of clay, will run smooth, provided the clay is not too sandy and has tenacity enough to hold together. The clay may be too sandy and an addition of plastic clay would be desirable. If this cannot be done, temper the clay longer by repeated watering, which will make it more plastic. In regard to the bar of clay breaking in small pieces about four inches long clear across the die, it may be that the cutting table was too low or too high, in which case a strain is on the bar of clay and of course it breaks. Sometimes a trifle matter is the source of a lot of trouble. There is certainly a cause and remedy for every trouble. If the steam lubricator does not stop the trouble try to lubricate with soap-suds or oil. Soap-suds is better than oil.

A. VOGHT.

Afflicted with Scum—What Is the Remedy?

Editor CLAY-WORKER:

We are manufacturing iron shale paving brick. Our shale is about 10 per cent iron and we use or have been using a plastic Fire Clay in the proportions of ¼ fire clay and ¾ shale. We have been troubled very much lately with a white scum or whitewash on our brick, it will be all over the brick and sometimes on the ends and sides only, sometimes on the ends only.

The fire clay has about 2-2 per cent of alkalies in it. Will you please send us some printed matter on the above subject, we don't want an expensive book. Something not to cost over a dollar or two.

We have double New Castle down-draft kilns that hold about 45,000 standard size brick, or about 32,000 9x4x3.

We use crude petroleum on the cutting table and on the ends of the brick. Can you tell us definitely what is the trouble? We start our kilns with coal and sometimes have trouble in getting our stack started to draw. But once we get it hot we have to shut off part of the draft. Trusting that you will be able to help us in this matter, we remain.

W. C. M.

Helpful Suggestions.

Editor CLAY-WORKER:

The indications are that W. C. M.'s troubles in whitewashed brick are caused by one of two conditions or possibly both. In using coal for fuel a quantity of water and sulphuric acid are produced governed by the relative quantity of volatile hydrocarbons as well as the amount of sulphur originally present in the coal. In the presence of water vapor this sulphuric acid has a tendency to cause a formation of sulphates and a deposition of the same on the outside of the bricks. Whenever the water has been taken away from such efflorescence then it forms the hard insoluble incrustation seen on the brick. It is the writer's opinion that if you place a small auxiliary furnace in construction with your stack proper you will have a hot stack (that is more draft) and thereby can draw the moisture out of your kiln more rapidly and thereby preventing in a great measure deposition of moisture on the brick in turn reducing the quantity of whitewash.

If you use a reducing fire (smoky fire) toward the end of your burning process you will take out the sulphuric acid part of the "whitewash" and remove it from the kiln which will leave the other component parts of the whitewash in a condition to act as a flux and combine with the clay and lo! "Presto, change," your whitewash will be gone, provided the temperature attained in the kiln has been high enough to obtain a reduction of the sulphate, such temperature generally not being high enough to injure the brick.

BEN THERE.

Vice-President Blair's Impression of Scum on Vitrified Brick.

EDITOR CLAY WORKER:

I have yours of July 29th, with copy of W. C. M.'s request for information as to the cause and cure for scum on vitrified brick. I think it is very doubtful if any one can give information as to what this is or how to avoid it. Possibly some firm handling coloring matters would be able to supply a color that would neutralize and destroy the effect of it on the brick, but for making paving brick it would not be practical to do so from a commercial standpoint. It does not injure the quality of the brick at all.

I am informed from reliable sources that the patent board of France has set aside a premium of $100,000 to be given to the person discovering what this scum or whitewash is.

The writer of this letter at one time laid the matter fully before Prof. Noyse who is now at the head of the Chemistry division in the Department of Commerce and Labor of the Government, and after giving the matter full consideration expressed himself as being doubtful if he could solve the question within a period of two years and Prof. Noyse is certainly regarded as one of the foremost chemists of the country, so you will see that our friends are asking a question that they perhaps have not realized the difficulties of the answer.

WILL P. BLAIR.

Cause and Prevention of Scum on Paving Brick.

Editor CLAY-WORKER:

The article in the July CLAY WORKER translated from the *Toeffer and Ziegler-Zeitung* should be read by this correspondent. The cause and remedy of scumming is so clearly and accurately stated there that I need only give a few practical hints upon the subject.

1. Carefully observe whether the scumming is done in the drier or in the kiln. If the drier had been described, something more definite could be said upon this point. Scumming is generally done in the drier, but one must look sharp to observe it on the unburnt brick. If it is done in the drier the parts of the brick in direct contact with other brick or with the car slats will not show the scum. By marking these places and setting the brick in the kiln with the parts of the face exposed in drier protected in kiln it will be shown by the scum marks after burning

whether the scumming or any large part of it is done in the drier.

2. Whether the scumming is done in the drier or in the kiln the only practicable remedy for the paving brick manufacturer is the same in either case. If the scumming is done in the drier, provide better circulation in the drier and dry as rapidly as the clay will stand. If the scumming is done in the kiln, the cause, secondary, is suggested in the statement: "We start our kilns with coal and sometimes have trouble in getting our stack started to draw."

The recommendations in this case are, first, increase the draft of the kiln during the early stages of burning. The substitution of induced draft for natural draft during this period saves time and, in some cases, helps out of such troubles as scumming. Second, if none of the above prescribed remedies overcome the trouble entirely, look to the water used in tempering and ascertain if it contains sulphuric acid, or salts of lime, magnesia or the alkalies. If this is not the case, then watersmoking with wood or coke, using a strong draft, may be what is needed.

As a last resort, if the market favors it, and the clay is suitable, reduce the iron and the sulphate by thick, heavy, smoky firing, or salt-glaze the brick, as some manufacturers do. You may thereby injure the toughiness of the paver or only conceal defects, but if your customers prefer that to the scum, isn't it good business policy to give it to them? R.

Wants to Know About Setting and Burning.

Editor Clay-Worker:

I would like to ask some of your readers for direction through the columns of The Clay-Worker for the setting and burning of brick in old fashioned, open top kiln, using wood for fuel. We have a brash, red clay, which is inclined to break in the yard and we get a great many bats in the kiln. The clay is broken down at the bank with picks, water thrown over same, and it then goes directly to a No. 8 Brewer machine. The trouble is in the burning and I will be thankful for some advice. Alvin Etheredge.

————, S. C.

Better Tempering Suggested.

In reply to the above I will say: The trouble is probably not in the burning at all, as Mr. E. positively states. If part of the brick break in the yard, there must be a cause for that and also a remedy. Mr. E. says that the clay is thrown down at the bank with picks and water thrown over same, and it then goes directly to a No. 8 Brewer machine. I do not doubt that the machine is a good brick maker, but in this case I believe, if the clay was run through a disintergator, before entering the brick machine, our friend from S. C. would undoubtedly stop the trouble of his brick breaking in the yard. I am inclined to believe that the clay by using the brick machine alone is not sufficiently tempered, there may be some hard lumps of clay, that are not softened enough in the machine and which form a part of the brick, and when the brick is dry, the softer clay around those hard lumps, shrinks away and the brick breaks. Some bricks may have only small lumps of clay and dry safe in the yard, but they break in the kiln. Why? Because in the kiln the brick have to carry the weight of other brick on top of them. Mr. E. will notice that most of the bats in the kiln are toward the lower courses. That goes to show that the brick do not stand the weight on top of them, because they are weak in the structure, caused most certainly by insufficient tempering of the clay before being thrown in the machine. This has a great deal to do with the results. For example, we know that clay ground in a dry-pan and then tempered in a pug-mill makes absolutely better brick than clay fed direct from the bank to the pug-mill or brick machine. Can anybody deny that fact? Therefore, I advise Mr. E. to get a disintegrator or a pulverizer in connection with his brick machine. Or it may be that his clay contains stones, in which case the proper thing to do would be to get a disintegrator with a stone separator attached to it, which will throw the stones out, or a crusher, which would crush and pulverize the clay and stones. A reader who receives information through a clay journal ought to report results for the benefit of others, who may have the same trouble. Experience.

Questions for Burners.

Editor Clay-Worker:

I am seeking information in regard to the relative value of fuels. Maybe some of your readers will aid me. Good oak wood here costs $2.00 per cord. Good coal costs $2.85 per ton. I have always burned with wood. I would like to know which is the cheaper fuel and why? Also the size and length of grates best to be used in burning with coal and how they should be used. That is whether the kilns may be closed with "green" brick, in the old fashioned way. How far in the arches should the grates go, or would it be better to build furnaces on the outside altogether, and if so how far from the kiln should they extend and how long should the grates be? These questions relate exclusively to the use of coal and I will greatly appreciate any information your readers may give me. I understand quite well how to burn with wood, but never used coal.

I have contract to burn 600,000 for new court house here, will make them by hand in the good old fashioned way.

————Ark. W. A. T.

Wood vs. Coal for Burning Brick.

The value of wood versus coal can be readily ascertained by referring to the following table:

1 cord hickory or hard maple	weighs 4,500 lbs. to	2,000 lbs. good coal
1 cord white oak	weighs 3,850 lbs. to	1,711 lbs. good coal
1 cord beech, red oak or black oak	weighs 3,250 lbs. to	1,445 lbs. good coal
1 cord poplar, chestnut or elm	weighs 2,350 lbs. to	1,044 lbs. good coal
1 cord average pine	weighs 2,000 lbs. to	890 lbs. good coal

The above figures refer to good, sound and dry wood and the value of wood, as a fuel, is very rapidly diminished by an excessive moisture contained therein.

The "American Society of Mechanical Engineers" has adopted the following rule:

1 lb. of wood is equal to 0.4 lbs. of coal or
2½ lbs. of wood is equal to 1 lb. of coal.

Other authorities estimate 2¼ lbs. of dry wood are equal to 1 lb. of good coal. Of course these comparisons are relative, depending upon the quality of the coal as well as that of the wood. A safe factor to bear in mind is: that one pound of wood is practically equivalent to one pound of any other kind of wood equally dry.

However, should you desire to burn with coal we are inclined to believe that outside furnaces would be the easiest to handle for a novice, in connection with clamp up-draft kilns. There is not so much iron necessary in the construction, and the use of such a type of furnace does not require the employment of experienced firemen. These fire boxes generally have 4-foot grate in length and as a rule terminate on a line with the outside face of the kiln wall. Your experience with wood on your clay will give you a good guide for burning with coal, if you figure and use the equivalent fuel value in coal. A. Burner.

FIRE CAUSES MUCH DAMAGE.

Terra Cotta Works of Conkling & Armstrong Destroyed.

The famous Terra Cotta Works of Conkling & Armstrong, situated at Wisahicken and Bristol Ave., Nicetown, Philadelphia, were destroyed by fire July 31, causing damage to the extent of $150,000—$100,000 of which is covered by insurance. The fire started in the kiln room, the largest of four three-story buildings comprising the plant. The first man to discover the presence of fire was Andrew Plinsky, one of the six men employed as watchmen, and whose duty likewise was to keep up the kiln fires. The man immediately sounded the whistle and three alarms were turned in, but the flames once started, spread so rapidly that the firemen were unable to make much headway.

Strange Irony of Fate.

Mr. Armstrong and wife had returned the previous evening from a delightful sojourn at Saratoga. Seeing the engines pass he followed, only to discover that their destination was his own "plant." A large order amounting all told to $500,000 had been booked by them four weeks ago, and only $25,000 of same had been filled as yet. Six firemen were injured by flying brick and were taken to the hospitals, Samaratin and St. Lukes. A boy spectator, while the fire was raging, fell beneath a passing freight train, the wheels of which severed his right arm.

It is to be hoped that Conkling & Armstrong may soon be able to resume and continue business. Their fine work is the admiration of all who can appreciate beauty and art. Philadelphia has been greatly improved and beautified by the many specimens of their work on her finest buildings.

Webster & Keyser, of Philadelphia, Pa., have all their kilns in full working order once more. Their recent fire having retarded business but little. Mr. and Mrs. Keyser are at present spending their vacation near Mt. Pocono. M. E. L.

DOWN IN JERSEY.

Editor Clay-Worker:

We presume you have heard of the great demand a few years ago for pock-marked brick. Recently we have not noticed so many used, but Old Sol has shown so hot so many times this season it seems to have caused one thunder storm after another, and the rain pours in torrents two or three times a week. Well, this is the way pock-marked brick are made. They are placed on outside yards and when turned on edge the rain pelts the partailly dried clay so hard it pits the cube and make a very beautiful brick, after burning, of course. If the outside yards have not been compelled to wheel back to soak pit thousands this summer we miss our guess.

Since our last letter all this region has continued to prosper, especially in the manufacture of clay products. Common brick are selling at $8 per 1,000 in Perth Amboy, and there are more being used this season than for some time back. On all hands one can see block after block of stores and dwellings going up. Of course, it would not be Perth Amboy if the large majority were not frame instead of brick.

Plans are now out for the new Postoffice building in Perth. We understand it is to be of brick and terra cotta. Some of the finest buildings in Amboy's history are now under way. This year additions to two old school buildings are being made, and one new structure, at a cost of $40,000 is about to be commenced.

Talk about degenerating and small families. Certainly Amboy holds her own. It must be something in the air. While driving along the streets one has to keep tight hold of the reins and keep one's eyes open or a kid will be knocked over. A school house of twelve to fourteen rooms every two years isn't bad, is it? They are all of brick, too.

All the factories are in full swing, and the Isaacs factory is now also making hollow brick.

At Weber's, immediately adjoining, lightning played havoc with an immense wooden tank that supplied Weber's factory and cottages with water, during one night a couple of weeks ago. A severe electrical storm passed over this region, lightning striking in many places. A few minutes past seven in the evening a terrific tearing noise was heard immediately back of the Weber Inn, and an avalanche of water found its way over the hill. An examination showed that the lightning had weakened the tank, and, as usual, in the morning, they were filling the tank full for the day. The extra pressure burst the tank. Connections were made directly to the mains and work proceeded without great delay.

A new dryer is being tested at the old Kearsy plant, now owned by the National Company. If this is a success, I hope to be able to describe it for your readers some of these days. It is an immense affair, as one can see from a distance. This plant is now utilizing the old front brick department for making hollow brick. The other two plants are running full on conduits and hollow brick.

At the Henry Weaver plant, lightning cut one corner off the big continuous kiln stack. Indeed, we wonder that many of these very high stacks are not struck, as they tower to the heavens and can be seen for miles away.

All the terra cotta works are busy, especially the Tottenville works. Recently they have secured some very fine orders and are as busy as they can be.

Another great improvement in Perth Amboy at present is the paving of Washington street from the sound to the western edge of the city, or to the Metuchen Amboy road. The contractors who have this work in hand are pushing matters and it looks like a fine job. Other streets are to be paved with asphalt, treated wooden blocks and the Warren bithulicic pavement. We prophecy that after the others are all worn out the brick will be still as solid as they are to-day.

You remember some four years since we wrote you for data concerning the number of paving brick used up to that date, explaining we desired to use the data in connection with the paving of Highland Park Hill at New Brunswick, this county. Well, a letter we wrote at the time to the Home News was before the Board of County Freeholders, and I was complimented for my effort by the Home News. Well, the hill was paved with brick, which our eyes condemned before they were placed on the hill, as too brittle or glassy to last. They are now about gone, but we have heard of no complaints from drivers of the slipping of horses on the brick, which latter stirred up the controversy in the start-off. We have hauled our heavy machinery both up and down this hill at all seasons without extra help. The day is coming for the East to use more brick.

Recently we have visited Albany, Troy, Saratoga Springs, Amsterdam, N. Y., and Providence, R. I., Fall River and New Bedford, Mass., and found each of these cities well paved with brick, stone, asphalt, etc. The streets of Fall River, with its immense cotton mills, are paved principally with granite, but all these cities use vast quantities of brick. Will the clay industry ever cease? Well, if New Jersey ever gives out, we can immigrate to Alabama and Texas, where there are thousands of feet of clay. You may not believe me, but during last year I drilled a well 2,000 feet deep near Beaumont, Texas, and found clay almost the whole distance. Besides, they have the finest fuel on earth down there.

But here are all my neighbors, Mr. Charles S. Edgar, Mr. Augustine Campbell, Mr. Charles Bloomfield, The Phieffers, Warner & Son, Weber's Sons, National, Mr. A. Edgar, and, I declare, I am just now unable to name all the various miners and shippers of clays from this county, who have, collectively, millions of tons yet to uncover. Of course, Mr. Charles S. Edgar probably takes the lead in value, as his mines in Florida are of the finest. Mr. Edgar has recently returned home from North Carolina, where he was prospecting for kaolin. The thermometer got up to an even hundred down there, which is just a little hot, even for a clay man to stand.

Mr. M. A. Edgar and Mr. Rock, former superintendent of Ravitan Traction Company, of Perth Amboy, have formed a copartnership to handle building material and are located at 152 State street, Perth Amboy, in the former office of yours truly. They are doing well and shipping large quantities of sand, fire brick, etc.

The Woodbridge factories are all running, although some fine brick are being piled up at Valentine's immense plant, between Metuchen and Amboy. The brothers never shut down, but stock in sheds if orders are slack for a time. In this way their men are kept busy all the year around.

Robert Valentine still smokes his favorite Pittsburg stogie, and we noticed the other member of the R. M. & H. Valentine Company going down the pike in a fine automobile a few days since. They have made an immense hole in their old mines near the brick factory in the past two years; so, also, has David Brown, adjoining.

Your old friend, Charles Bloomfield, ships about as many tons as his neighbors. We noticed three large schooners tied up at his docks a few days ago, waiting their turn to be loaded. Mr. Bloomfield has so rebuilt and modernized his old homestead below town that one can hardly realize it is the same place. It is positively one of the finest country places in this section, and when his boulevard is finished it will indeed be a handsome place.

Charles Volkmar, Ceramist, has erected in this town a school building and kilns and we understand has quite a neat plant and quite a number of pupils in the clay arts.

We have just finished a well on Mr. McCabe's property, just over the western city line of Perth Amboy, in which we drilled through thirty feet of the most beautiful colored clay we have ever found in Jersey. Mr. McCabe has for years been a miner of clay, at Spa Springs and now is at National Company's banks, at Kearby. Under these colored clays we find spar and then clays again. Some day it will be very valuable property. W. R. O.

PATENT SUIT.

Suit was brought Feb. 23, 1904, against the Hamilton Brick Co., of Hamilton, Ohio, by the Horton Manufacturing Co., of Painesville, Ohio, for infringement of their patent on their Hercules brick machine. The Hamilton Brick Co. is using a machine made by the Arnold-Creager Co., of New London and Cincinnati, Ohio, and is called by various names such as "S. S. S.," the "New Century," the "Success," etc.

5 tf L.

Written for The Clay-Worker.

BRICK AND BUILDING NEWS IN AND ABOUT BUFFALO.

THE AMOUNT of work going on in the city will compare favorably with other cities. In the spring we had the strike of the stonemasons, that was followed by the bricklayers, and delayed work some, but all has been amicably settled. Work was not rushing, so the contractors just sat back and waited for the men to come to their senses. The cause of the strike was the stonemasons were opposed to concrete work.

The number of permits issued in July was 226, estimated total cost being $722,395. There is quite a lot of work going on outside of large contracts, the old Heugerer store, 256 Main street, is being remodeled. Some $200,000 is being spent to make it a modern, up-to-date store. The Larkin Soap Company is putting up a $300,000 office building. The new theater on the site of the old one, on Court street, is nearly finished, and is a grand and imposing structure. The old North church, on Main near Chippewa street, has been torn down and a new theater, called the Keith, extending from Main to Pearl street, will be built on the site. The Masonic fraternity of the Thirty-eighth District laid the corner-stone of a new temple for Ancient Landmarks Lodge No. 441, F. & A. M., on July 19th. It is located on Pearl near Genessce street. The grand master of the Grand Lodge of the State of New York, assisted by several distinguished Masons, performed the ceremonics.

The McKinley monument, for which the legislature of the State at its last session appropriated $100,000, is at last an assured fact. Contract has been let to George W. Maltby. It is to be located on Niagara Square, and can be plainly seen from all directions. Consent had to be obtained from the various parties interested in the land. A strong opposition to the location developed among some property owners adjacent to Niagara Square, but it has all died away, and the work will proceed at once.

There was to be two large sewers built that would require about four million bricks. Against one a strong opposition has arisen, and no action has been taken to start the other one. Some of our best contractors decline to figure on city work, as it is so uncertain when the work will go on or whether it will go on at all. A single case of delay in municipal work was stated to me by an ex-alderman of this city. In 1886 he was on a committee to look up a site for a new quarantine hospital. The committee examined the several sites that were offered. Objections were raised by the residents in the different localities, and the matter was dropped. To-day, after a lapse of eighteen years, they are building a $50,000 quarantine hospital on the same grounds where the old one has been located for all these years.

Our city fathers have taken their annual vacation till the first week in September—have gone to rusticate and recuperate. All warrants for work done must await their return.

Trade at Brush Bros.' plant, at Jewettville, has been a little slack, but it is picking up, and orders quite satisfactory are coming in. Brother Morton is still in charge out there.

The Ellicott Brick Company are busy and increasing kiln capacity by building new kilns. Some time ago the secretary expected to land an order for four million brick, but the work still hangs fire, waiting for the city engineer to order the work to go on. The fact of the matter is, our city government is in sore financial straits. In order to keep the rate for taxes down, pending the presidential election, the appropriations in a number of the departments were cut to the red, and in consequence work is being held up.

A friend in a municipal department in Toronto writes that city is experiencing a boom in the building line. Operations for the first half of the year, or to July 1st, amount to three and a half millions, and permits for July amount to about one million dollars. The great fire of April 19th is responsible for many fine warehouses being built, but the building of houses, also, exceeds similar operations in all previous years.

The DuBois & Butler Brick Company, with yards at Falls Creek and Butler, Pa., are having their share of the business going on. They secured in June some very advantageous contracts, one for 1,000,000 common and another for 300,000 face brick repressed. Brother Matson is a hustler, and when he goes for a contract his competitors must get up early in the morning to get it away from him.

Brother O. W. Meyer started up his large plant at Wanakah on February 29th, the only time in this life that he expects to start on that date again. He has been continually in the harness since that date, making and filling orders. He has an auxiliary machine for making hollow brick, but at present is too busy making commons—overrun with orders for the straight brick. He expects in the near future to make enough hollow brick, to be independent of competition for this class of product, and also to make a front brick. His continuous kiln is operating successfully. He has not computed exactly just what the cost per 1,000 for burning is, as he uses the coal pile indiscriminately, for kiln, dryer and boiler. He feels satisfied that he has solved that difficult problem in this vicinity—the ability to make a shale brick, which can in every conceivable condition compete in quality and price with a soft mud brick. "Norton."

Written for The Clay-Worker.

PACIFIC COAST NEWS.

IF THE PRESENT demand for brick continues, it would not be at all surprising if by next year the price advanced considerably. There is as much or more building activity than a year ago, and there bids fair to be still more. Some of the new kilns that intended to enter the market with brick made this summer have not made what was figured on, on account of improper machinery or poor clay. The demand has been so active that a number of yards are bare already, and it is doubtful if there will be brick in great plenty during the coming fall and winter.

The Bay View Brick Company, San Francisco, Cal., contemplate adding a soft mud equipment to their plant. They now manufacture by the stiff mud process.

Wilson & Lyons have their new plant in operation, but have only made about 2,000 brick so far, owing to delay in the machinery.

The clay mine of Fairlee & Jensen, at Benson, Ariz., is turning out about twenty tons of clay per day. The clay is in demand for lining converters in smelters. Fairlee & Jensen have on exhibition at the World's Fair at St. Louis a lot of the clay, and it is attracting considerable attention from those who use that kind of material.

George Kreiger has just completed burning a kiln of 200,000 brick at Dallas, Ore., and has another started. Mr. Kreiger is making extensive improvements at his yard, including a 450-foot sidetrack which will give him an advantage of 90 cents on the shipping price. By the middle of October Mr. Kreiger expects to burn between 1,500,000 and 2,000,000 brick. This fall Mr. Kreiger contemplates putting in a brickmaking machine.

The Washington Brick & Lime Company is adding two new kilns to their works at Bay View, Wash., on Lake Pend O'Reille. Among other improvements they are also building a wharf, a warehouse and a big barge on which to carry the material.

J. F. Edwards, secretary of the Culesac Brick & Tile Company, has brought to Lewiston, Idaho, a sample of brick burned in the first kiln fired by his company at Culdesac. The brick is a first-class article and the company has decided to operate the plant at full capacity as soon as a new engine can be installed. George Martin, cashier of the Culdesac Bank, is president of the brick and tile company.

The Corona Pressed Brick and Terra Cotta Company, of Corona, Cal., has opened a large quantity of clay on one of its Santa Ana Mountain deposits. The clay burns to a beautiful buff color and will be used by the company to make pressed brick of that shade. Red pressed brick is also being made by the company from some of its own clay.

The Wilson-Lyon Brick Company has its brickyard on the Richmond Belt Railroad at Richmond, Cal., in successful operation. The yards will have a capacity of 100,000 brick daily.

Joseph Micelli has just finished burning a kiln of about 200,000 brick at Roseburg, Ore., and has 100,000 ready for the second kiln, which will contain about 400,000 when completed.

George Lord has sold an undivided half interest in the Lord-Richardson fire clay deposits in the mountains near Corona, Cal., to Barth & MacGillivray.

San Francisco, Cal., August 5, 1904. Sunset.

OBITUARY.

A Noted Californian Passes Away.

P. N. Remillard, the millionaire president of the Remillard Brick Company, of Oakland, Cal., died at his home there August 3d. His death was unexpected and resulted from a stroke of paralysis. Mr. Remillard was 63 years of age.

Charles A. Lawrence, Beverly, Mass.

Charles A. Lawrence, Beverly, Mass., died at his home in that city August 8th, at the age of 75 years. Mr. Lawrence was a native of Beverly and was one of the best known men in that section. For years he operated a large pottery. He gained fame and fortune by manufacturing "Lawrence" bean pots. A widow and three children survive him.

Robert Ballard, Syracuse, N. Y.

Robert Ballard, president of the National Pressed Brick Company, Syracuse, N. Y., died at his home in that city, August 2nd. His death was due to Bright's disease. He was born at Kent, England, May 24 ,1840, became a resident of Syracuse in 1870, since which time he has taken a prominent part in all matters of public interest. For the past five years he has been a member of the City Aldermanic Board. He leaves a widow and six children.

M. C. Meigs, Hoosier Poet Brickmaker.

Montgomery C. Meigs, Lafayette, Ind., died at his sister's home in Indianapolis, August 9th, in his fifty-sixth year. Mr. Meigs has been identified with the brick and tile business of Indiana for many years, and enjoyed a wide acquaintance among the clayworkers throughout the Central West, having been quite regular in attendance at the various State conventions for a score of years past. He was a successful clayworker and a gifted writer and poet, his most noted production in verse being "The Voice of the Tile." He leaves a widow, two sons and two daughters.

W. P. Lockington, Philadelphia, Pa.

Mr. W. P. Lockington, who for many years has served The Clay-Worker faithfully and well as correspondent at Philadelphia, died at his home in that city July 20th. Mr. Lockington was in the prime of life, and his untimely demise will be mourned by all who knew him. He was born in England in 1857 and came to America in 1885. For a time he devoted himself to the profession of architecture, but having a natural taste for literature, the latter years of his life were devoted to journalism. Mr. Lockington was a man of kindly nature, steadfast and true to those with whom he was associated. He will be missed and mourned by the clayworkers of Philadelphia, to whom his frequent visits were a source of much pleasure, for he carried with him always an atmosphere of good cheer. His widow and one son survive him.

Elijah Walsh, New Windsor, N. Y

Elijah A. Walsh, a well-known brick manufacturer of the Hudson River section, was instantly killed July 26 at his brickyard at New Windsor, N. Y., by a fall from a piece of scaffolding which was being used in putting up some shafting. His neck was broken, though he fell only about nine feet. Mr. Walsh was formerly in the brickmaking business with his brother, Jerome, at Stockport, N. Y. A company was recently formed to carry on the business and Elijah Walsh withdrew from it. He took possession of his father's old yard at New Windsor a short time ago and began to get it in readiness to manufacture brick. He was engaged in directing this work when he was killed. He had expected to have the yard in condition to begin work within a week. Mr. Walsh was an ardent lover of aquatic sports and a member of Mecca Temple of Mystic Shriners, of New York. He was unmarried and forty-five years old.

COLORED BRICK.

There has been during the past year or more a very marked tendency to the extensive use of plain red brick in some of our large cities, and we have frequently been asked whether in our opinion bricks of other colors have had their day, or in other words whether the better class of architects who are now using red brick in many of their buildings will abandon entirely other colors. Our opinion, based upon knowledge gathered from visits to the offices throughout the country, is, that the particular style of brick is influenced a good deal by the prevailing fashions, but that in no case do we find an architect to say that he will be satisfied under all conditions with any one style or color. While very many red brick are being used, the demand for the best of other colored brick has increased considerably, and we have yet to hear of a single firm which has restricted its work to the use of red brick. On the other hand, many who have used red brick to a large extent for a year or more are again using other colors in some of their more important work. A few years ago a certain style of rough brick was manufactured for use in one of the buildings of Harvard University. The design called for a wall with a great deal of texture, and this was so admirably supplied by the rough dark burnt clay that for some styles of buildings the so-called Harvard brick has been very generally adopted. Like all good things its use developed in time into a fad and was called to excess, but we believe it is fair to say, however, that in many cases the plain red brick has been used as a substitute for stone rather than as a substitute for brick of other colors, and that the demand for the varied colors has steadily increased year by year.

With the present tendency to introduce color into our architecture, and we believe this to be no passing fad, we feel certain that our best architects will continue to use, as they have in the past, brick of those colors which have a dignity and fitness for special purposes. It would be idle to specify these colors, for the reason that it is not our purpose in answering these questions to provide a palette from which the architect may choose. We will, however, venture the opinion that a well made clay brick of any of the standard colors or shades now used will in the future find a greater market than has existed in the past, and that no color or style of brick will be adopted to the exclusion of all others.

The Brick Builder.

TRADE LITERATURE.

THE AMERICAN CLAYWORKING MACHINERY COMPANY, BUCYRUS, OHIO, has recently issued a miniature or vest-pocket edition of their immense annual catalogue. It is a very pretty and handy little brochure which any of our readers can have for the asking.

THE JEFFREY MANUFACTURING COMPANY, COLUMBUS, OHIO, are out with their special price-list No. 62 B, which deals chiefly with water elevators. It is a typographical gem, the cover being especially pretty. If interested in any elevating proposition, whether water, clay, brick or any other commodity, write them for a copy, mentioning The Clay-Worker.

THE NEW YORK BLOWER COMPANY, CHICAGO, are mailing their new catalogue, No. 51, and will be pleased to mail one to any reader of The Clay-Worker who has not already received a copy. In writing for it, address the company at Chicago, where their main office is located at Twenty-fifth and Stewart avenue. The book is devoted to their "Built Right—Run Right" variety of fans and blowers, which have proven very effective in waste heat dryers.

THE AREGOOD CONSTRUCTION COMPANY, CHICAGO, has favored us with a copy of their new catalogue. It is a neat book of 24 pages, in paper cover, and contains an illustration of a model brick plant built from plans prepared by them, also cuts of the Aregood Dryer and an interesting description of same. Readers of The Clay-Worker are requested to write for a copy, addressing the Aregood Construction Company, 409 Chamber of Commerce Building, Chicago.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

VOL. XLII. AUGUST, 1904. No. 2.

CURRENT COMMENT.

There is more reason now than ever for putting the plant in good order.

* * *

One thing certain is that before long no bricks that show efflorescence will be tolerated.

* * *

The hampering of brick laying from any cause chokes down the fires in the brick kilns.

* * *

Water, the thing that does so much damage to an asphalt pavement, does not hurt a good vitrified brick.

* * *

Not the least of the beauties about the clay industry comes from the general distribution and liberal supply of the raw material.

* * *

Continued eruption on the case of a clay brick is considered by many to be as much a sign of disease as eruptions on the face of a human brick.

* * *

There has been lots of hot air wasted in this world, but the up-to-daters in the clay industry make the spare hot air around their kilns do a stunt at drying.

* * *

It takes a lot of heat to destroy a good brick, but just a little carelessness this time of the year may lead to the destruction by fire of sheds and other valuable property used in connection with the manufacture of brick.

* * *

The condemning of poor brick before they are laid in the street is much better for the trade as a whole than public condemnation of brick paving that is faulty from the use of inferior brick. And the beauty of it is, that while you have to lay an asphalt street and wait for the flaws to develop before you can know whether it is really good, bad or indifferent, you can test and pass on brick to a moral certainty before laying it.

* * *

Our interest in a foreign war should not distract attention from the greater war that was commenced at home, the new civil war on the question of the closed or open shop.

* * *

Shall the workshop, the private property of one American citizen, be closed by an irresponsible body of men in union to every other American citizen who refuses to submit to union rules. That is the vital question.

* * *

Many an idea on the subject of improved brick machinery for clayworking has been sadly disfigured when put to the test of practice, but from every failure we have learned a lesson, and the net result in improvements has not only paid for all past efforts, but justifies an unabated continuance.

LABOR TROUBLES AT THE NATIONAL CAPITAL.

The report of our Washington correspondent, on page 150 of this number, which tells of an ineffectual attempt of the bricklayers' union to cause Uncle Sam trouble, is quite interesting. It seems that the union bricklayers drew the color line and the Government engineer drew the Constitution. Work was suspended temporarily, but the Constitution won a speedy victory. At last accounts the colored bricklayer was saying nothing and plying his trowel.

ANY COLOR, SO IT'S RED.

Fads may come and fads may go, in architecture as in other things, but in the matter of color scheme it may be depended upon that in the long run public taste will demand and insist on having the good old-fashioned red brick for the major part of our permanent buildings. A little variety in color is desirable always, but for a steady diet there is nothing in the color scheme of architecture equal to good red brick. We are not at all surprised, therefore, by the statement of our distinguished contemporary, *The Brick Builder*, reprinted on the preceding page, declaring that once more red brick is the popular favorite with the leading architects.

TO BE SOCIABLE AT THE WORLD'S FAIR.

The suggestion of a social gathering of the members of the N. B. M. A., at the World's Fair, the first week in October, has met with much favor. Not only are the members interested, but many clayworkers who are not members of the National Association, will visit the Fair at that time. It is needless to say that all will be welcome, and if non-members will call at the N. B. M. A. exhibit in the Mines and Metallurgy Building and register or otherwise make themselves known, they will receive the glad hand, and be made to realize that there is a fellowship among all workers of clay of whatever degree, which insures a season of pleasant social intercourse and profitable interchange of views and experience, whenever and wherever they may meet.

Noting the mention of the proposed gathering in the June CLAY WORKER, our contemporary, the *Ohio Architect and Builder* comments on the scheme as follows:

"The list of conventions scheduled for the World's Fair at St. Louis is indeed a long one but in addition to the formal gatherings to be held there it is likely that many informal meetings will mark the progress of the summer. For instance, the National Brick Manufacturers Association, which holds its regular conventions in February, has arranged for a gathering of brick makers at the Fair the first week in October. The purpose in fixing this date is to stimulate the attendance of members of the association at the time named, in order that they may meet at the Exposition grounds and enjoy each other's company while inspecting the sights. The arrangement offers a good suggestion to other organizations of this kind who hold winter gatherings. Many members of such organizations would regard it much more pleasant to visit the fair at a time when they would be able to meet their friends and associates, for in companionship is much of their pleasure centered. By fixing a specific time for the visit of members of these organizations or crafts the desired results will be attained. Instead of giving time to serious thought and to the hearing of discussions of papers and essays on technical subjects, the visitors will have an opportunity to cultivate the social side of association membership and will find delightful recreation in the informal meetings upon the grounds. In olden days, when the county fairs were popular, it was the custom for families to hold reunions on certain days, thus bringing members from far and near and making the occasion one of prominence and pleasure. While the Exposition is most too large for anything of this sort, it nevertheless can be wisely taken advantage of in the manner to be observed by the clayworkers."

SUMMER MEETING OF AMERICAN CERAMIC SOCIETY.

The American Ceramic Society will hold its sixth summer meeting at St. Louis during the week, beginning Monday, September 5th. The meeting will be purely social in character. There will be no exercises or formal sessions. It is the plan for the members to have a register open at the desk of Prof. H. A. Wheeler, in the Clay Industries Exhibit in the Mines Building, in which the visiting "Keramikers" are supposed to put down their names and their St. Louis location, and date of their expected stay. It is also expected to have a noon meeting daily at this point as headquarters, from 11:30 to 12:30, at which the members can come together and make appointments for the afternoon, evening and following morning, and can take lunch together at the close of the noon hour. By means of this daily hour for social chat and the forming of mutually agreeable plans, the members will have just the opportunity they desire to keep in touch with each other, and yet the work of each one will still retain the elasticity which a successful visit of the fair requires. Many members having their families with them will be unable to give the society more than a share of their time, and this arrangement will work to the very great convenience of those so situated. If a sufficint number register during the 5th and 6th, it is probable that an effort will be made to have one evening later in the week set apart for a social gathering. Members and others interested in the Society are requested to join in making this occasion an enjoyable and successful one. Any of our readers desiring further particulars will please address Edward Orton, Jr., Secretary, Columbus, Ohio.

THE PASSING OF ASPHALT AND WOOD.

From St. Paul comes another statement relating to the passing of wood block and asphalt pavement. St. Paul has had quite an extended experience in the use of various paving materials, and the result is told in the leading article of this issue. Brick is now acknowledged to be the best general pavement in use. Wood is acknowledged to be satisfactory for lightly traveled streets, but short lived and very expensive of maintenance. St. Paul put down over twenty-four miles of asphalt pavement. It took all of this experience to determine its real value. Brick was first put down questioningly, but after years of service, with good material, the pavement is now as good or better than it was the day it was laid. The first-class brick pavement is the only one which improves with age. Here in Indiana we have pavements which after twelve years of use are better than they were the day they were put down. This is because the slight imperfections on the surface and the tendency to smoothness have worn away and there is now a surface with a slight grit, which affords safe footing for horses, though perfectly smooth. Brick has had a hard fight because it never had an organized lobby of promoters extending over the whole country to place it before the powers that be, as have asphalt and wood block. Brick has come to the front through sheer merit, and despite the weak methods of the makers of the paving material in presenting it to the public. At times brickmakers have been their own worst enemies in that they have not provided the best material, but this condition has happily passed.

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I HAVE NO brickmaking troubles of my own now, but, as the woman said about babies, "I've had 'em, and I know."

Tell me your troubles. I have knowledge and experience for sale. That's all.

WILLARD D. RICHARDSON,
Consulting Engineer to the Brick Industry.
See pages 184 and 188.

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FOR SALE—One Quaker Steam Power Brick Machine, Pug Mill, and Potts Mould Sander, all in good condition.
BUTTE SEWER PIPE AND TILE CO.,
7 3 c Butte, Mont.

WANTED—Position as burner or foreman of a brick plant, by a man with long experience. Can give best of reference; am at present engaged, but wish to make a change. Address
8 1 c G. B., Care Clay-Worker.

FOR SALE.

One 4-Mold Dry Press, excellent condition, very cheap. One 40-inch Stedman Mill, used three weeks. Price, $200. Address NEW,
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Brick works superentendent (red or fire brick) seeks re-engagement. Thoroughly experienced in soft mud, stiff mud and dry press machinery, up-draft, down-draft and continuous kilns. Can erect machinery and build kilns or dryer if required- Have had experience in best brickmaking centers of United States and England. Best of references. Apply SUCCESS,
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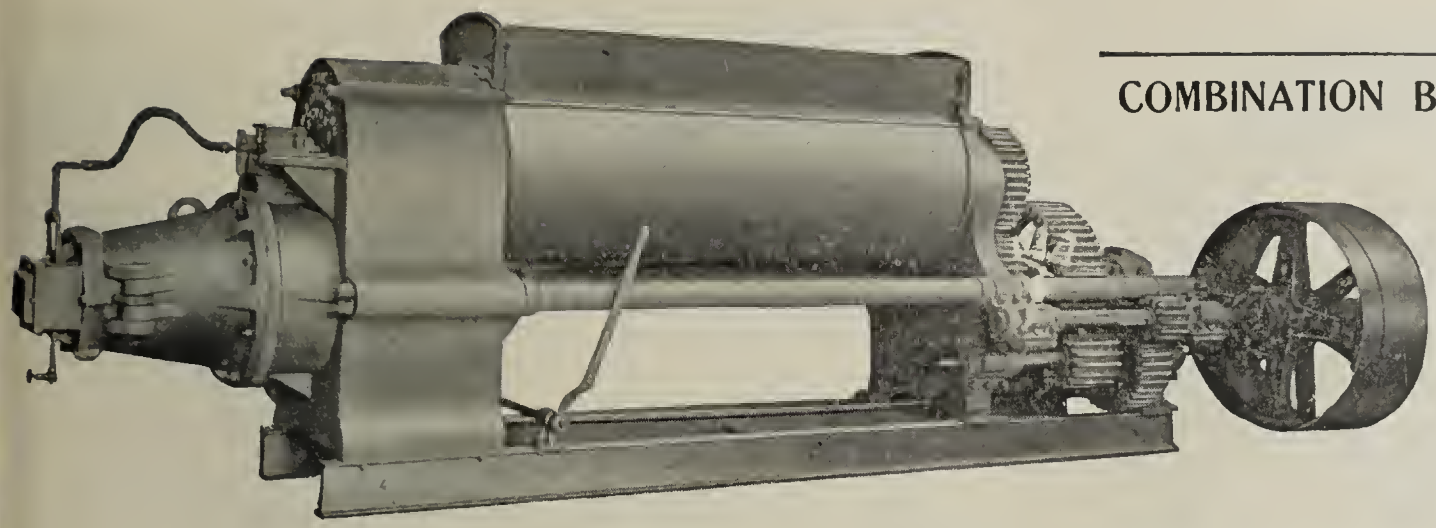

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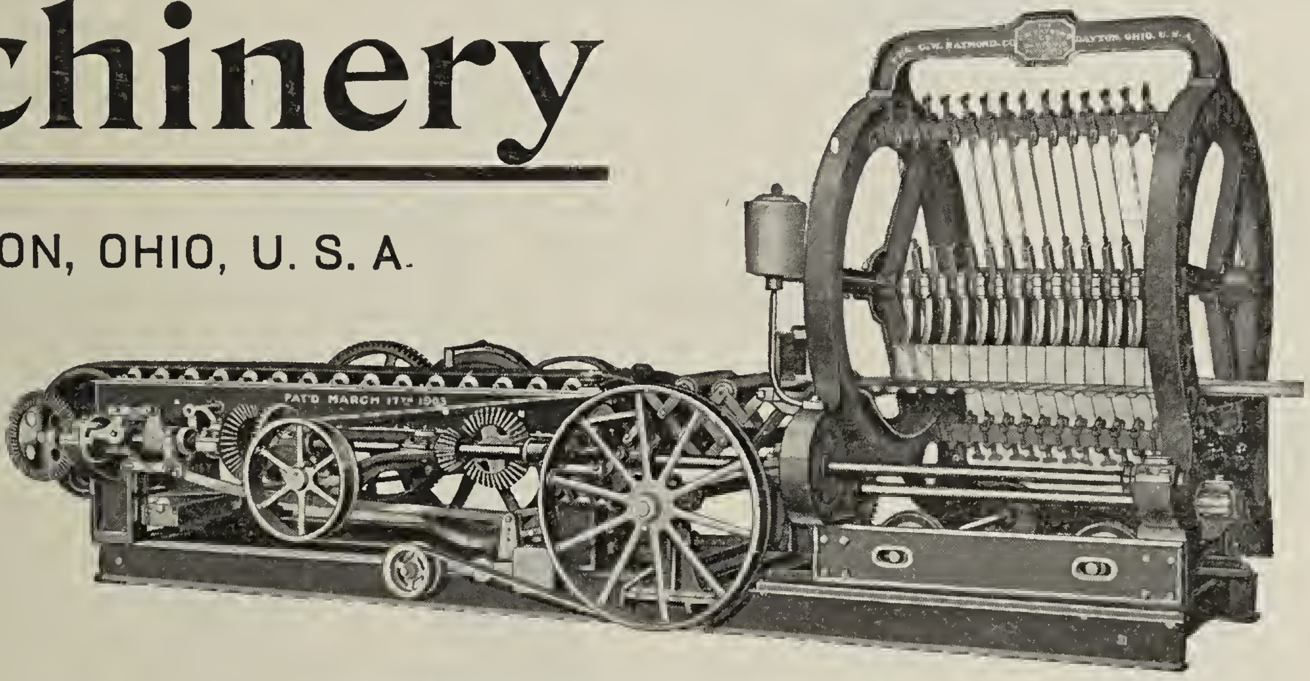

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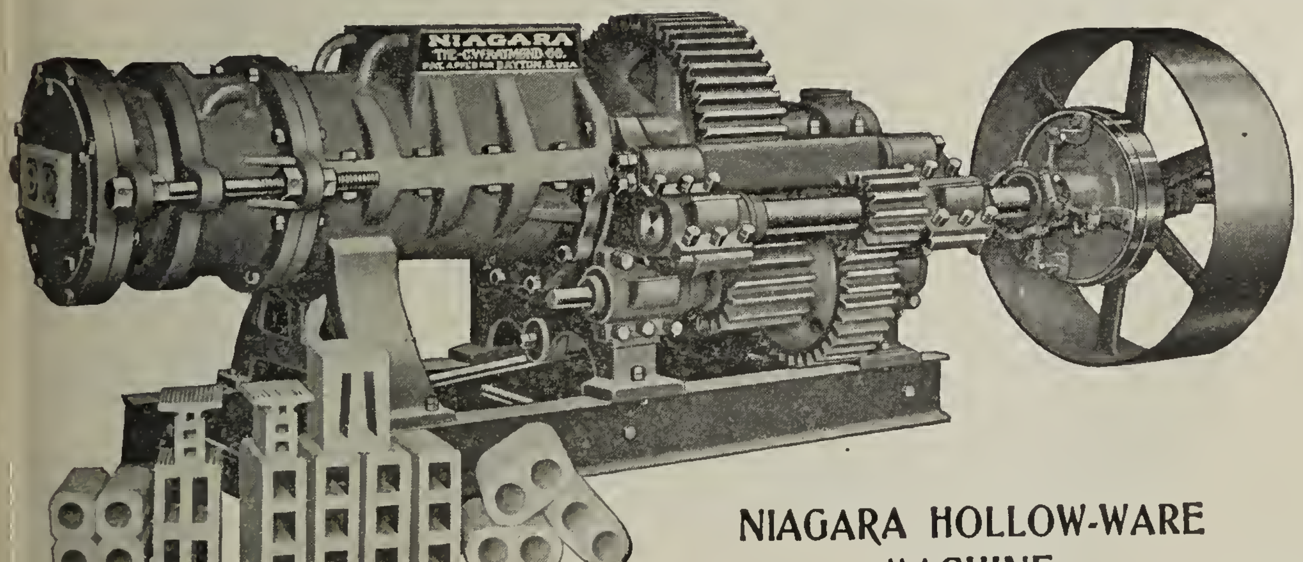

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Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Written for The Clay-Worker.

POTTERY NEWS.

THE POTTERY BUSINESS as a general rule has not been as good this spring and summer as it generally is. However, everything considered, business with the potters is probably as good in proportion as with any other branch of trade. All of the potteries look for trade to brighten up greatly when fall comes and when buyers start to lay in their holiday goods, which generally begins about the first of September. Some of the potteries in East Liverpool are fairly busy with a fair amount of orders ahead, but the majority of them are running their plants from hand-to-mouth, as it were. About two weeks' shut-down was made at July 4th by the majority of the plants, although some of them did not start up again until July 25th, at which time the Knowles, Taylor & Knowles Company and several of the larger potteries started up. The following notes will give you an idea of what some of the potteries throughout the country are doing:

It is reported that the Homer Laughlin China Company, of East Liverpool, are considering the manufacture of vitreous china, and in case they decide to go into the manufacture of same, a new plant will probably be erected. They now have thirty-two kilns.

The East Liverpool (Ohio) Potteries Company have just completed the installation of the sprinkler system in their Globe plant, and same is now ready for use.

The Riverside Knob Works, of East Liverpool, are erecting an additional kiln at their works in this city. The concern manufactures clay door knobs.

The National Electrical Porcelain Company, a new concern recently incorporated in East Liverpool, will, it is said, erect their plant in this city imemdiately. They have not as yet purchased a site, but it is said that one will be bought within the next two weeks, at which time the new plant will be started.

Mr. H. P. Knoblock, who has been secretary of the Potter's Co-operative Company, operating the Dresden Pottery Works in East Liverpool, for some time, and who has been connected with that institution for the past thirty years, has severed his connection with that company and disposed of his interests in the same, and will hereafter be secretary and treasurer of the Colonial Company, potters, replacing J. S. Wilson, resigned. Mr. Knoblock's place at the Dresden will be filled by Mr. T. A. McNicol, now treasurer of the company, becoming secretary and treasurer.

It is reported upon good authority that Mr. F. W. Fowler, president of the Union Potteries Company, will erect a six-kiln pottery down the Ohio river at some point, although just where is not as yet known, though it is thought to be at Parkersburg, W. Va.

At Elgin, Texas, a new pottery is being started by the Elgin-Butler Brick and Tile Company of that place. The pottery will have a capacity of about two kilns and will manufacture stoneware exclusively.

The Limoges China Company has been incorporated at Sebring, Ohio, with a capital stock of $100,000, taking over the plant of the Sterling China Company, owned and operated by Mr. F. A. Sebring, and turning same into a semi-porcelain plant in place of making vitreous china, such as they have been following since the pottery was erected. The incorporators are F. A. Sebring, F. E. Sebring, W. H. Sebring, C. E. Sebring and C. J. Albright. Mr. F. A. Sebring is president of the company.

At Cameron, W. Va., the Cameron Pottery Company of that place is in the hands of a receiver, and the stockholders, never expecting the plant to do any better, have offered to go down into their own pockets and pay the creditors 40 per cent. The creditors, as a rule, have not accepted the offer. A part of their immense indebtedness is secured. It is reported that the foundations under the buildings are giving away, allowing the walls of the buildings to crack and sink. The plant was built on an old creek bed.

The Sebring Pottery Company, of Sebring, Ohio, have reduced their stock from $250,000 to $10,000 on account of the Sterling plant being reincorporated individually.

At the annual meeting of the stockholders of the Continental China Company, of East Palestine, Ohio, the following officers were elected: W. S. George, president; J. F. Stoddard, treasurer, and R. N. Logan, secretary.

The Dresden China Company, of Salineville, Ohio, elected the following officers at their annual meeting: J. H. Dodds, president; H. H. Kirk, vice president, and H. R. Shaft, secretary and treasurer.

The National Electric Porcelain Company, the new concern at East Liverpool, Ohio, has elected the following officers: G. P. Ikert, president; George Kaufmann, vice president; P. V. Mackall, secretary, and George S. Thompson, treasurer.

At Carrollton, Ohio, the stockholders of the Carrollton Pottery Company are considering the advisability of erecting a new kiln at their works there.

A strike of short duration was lately on at the works of the Owen China Company, at Minerva, Ohio. The strike is said to have been caused by the employment of more than the allowable number of apprentices in the kiln rooms.

The A. Radford Pottery Company, at Clarksburg, W. Va., has started up their plant there and expect to be running full in every department within the next two weeks. Mr. John Knoblegard is president of the company, C. M. Raile secretary and treasurer, and A. Radford general manager.

The Novelty Pottery Company, the new pottery at Crooksville, Ohio, is installing some new machinery in their works in that city. The plant is now running full, and is turning out a nice grade of ware.

Ransbottom Brothers, who are erecting new kilns at Roseville, Ohio, have also decided to erect some new buildings for manufacturing purposes, and it is probable that the capacity of the plant will be just about doubled before they get through with the improvements that they are now making.

A new pottery has been started at Oakland, Cal., under the name of the Novelty Pottery Company. There seems to be a great call for art goods on the Pacific coast, and it is a wonder that attempts to start a first-class art ware plant have not been made before, but they have not. There have been several small concerns on the coast, but this is the first one of any importance.

East Liverpool, Ohio, August 1, 1904. Tom Potter.

ELECTRICITY FOR CLAYWORKING PLANTS.

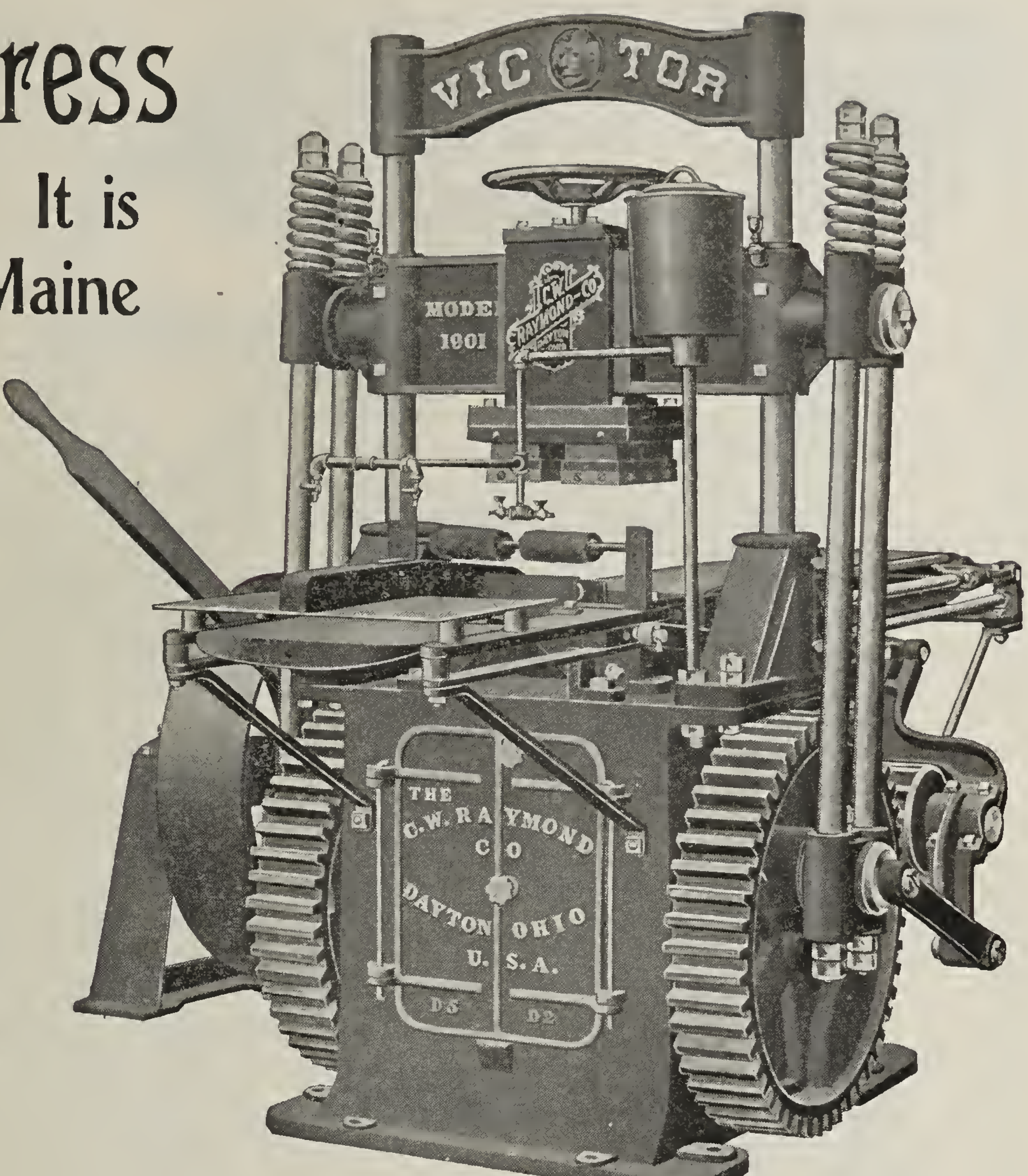
In all manufacturing lines economy of operation is the chief consideration. In many lines the introduction of electric power has proven very advantageous. It is, therefore, with more than passing interest that we note the introduction of electric driven machinery for clayworking plants, as illustrated in our reading columns. It is to be hoped that the coming of the motor foretells the passing of the line-shaft and the minimizing of manual labor. The industrial situation is such that it behooves every manufacturer to protect himself in every way possible from the machinations of labor organizations and unions. Wherever the services of one man can be dispensed with, to that extent is the danger of labor troubles averted. It is to be hoped that electricity may prove economical and afford an additional factor of safety for clayworkers.

THE NEW YORK SITUATION.

By a unanimous vote, on Saturday, August 13th, the Building Trades Employers' Association of the city of New York adopted a resolution which declares for an open-shop policy unless the striking unions come to terms on or before August 22nd. This is one of the distinguished epochs in a long, serious and bitter warfare between the trades unions and the master builders which has been going on in that city for many years. There has been much serious work and earnest effort on the part of employers to adopt a fair arbitration policy, but their efforts have so far been in vain. It would now appear that the Employers' Association has given up all idea of the possibility of dealing with the unions and feels that in self-defense they must declare for the open-shop policy. During the days following the announcement of August 13th, many additional strikes will probably follow. Already tile-setters, electrical and terra-cotta workers have proclaimed for a general strike. This is in addition to other branches that are now on the outside. It is hoped and believed that the employers now find themselves strong enough to deal directly with their employes rather than through arbitration. The workmen have had arbitration placed before them in ideal form, but they have failed to profit by it. The trouble in the metropolis is that the agitator of the Parks variety rather than the men themselves are in control of the unions. It is to be hoped that in the interest of the workmen, the employers and the public, that the corrupt union boss can be suppressed once and for all.

The Victor Re-Press

needs no introduction. It is known and used from Maine to California, ✳ also, somewhat in Europe, Asia and Africa.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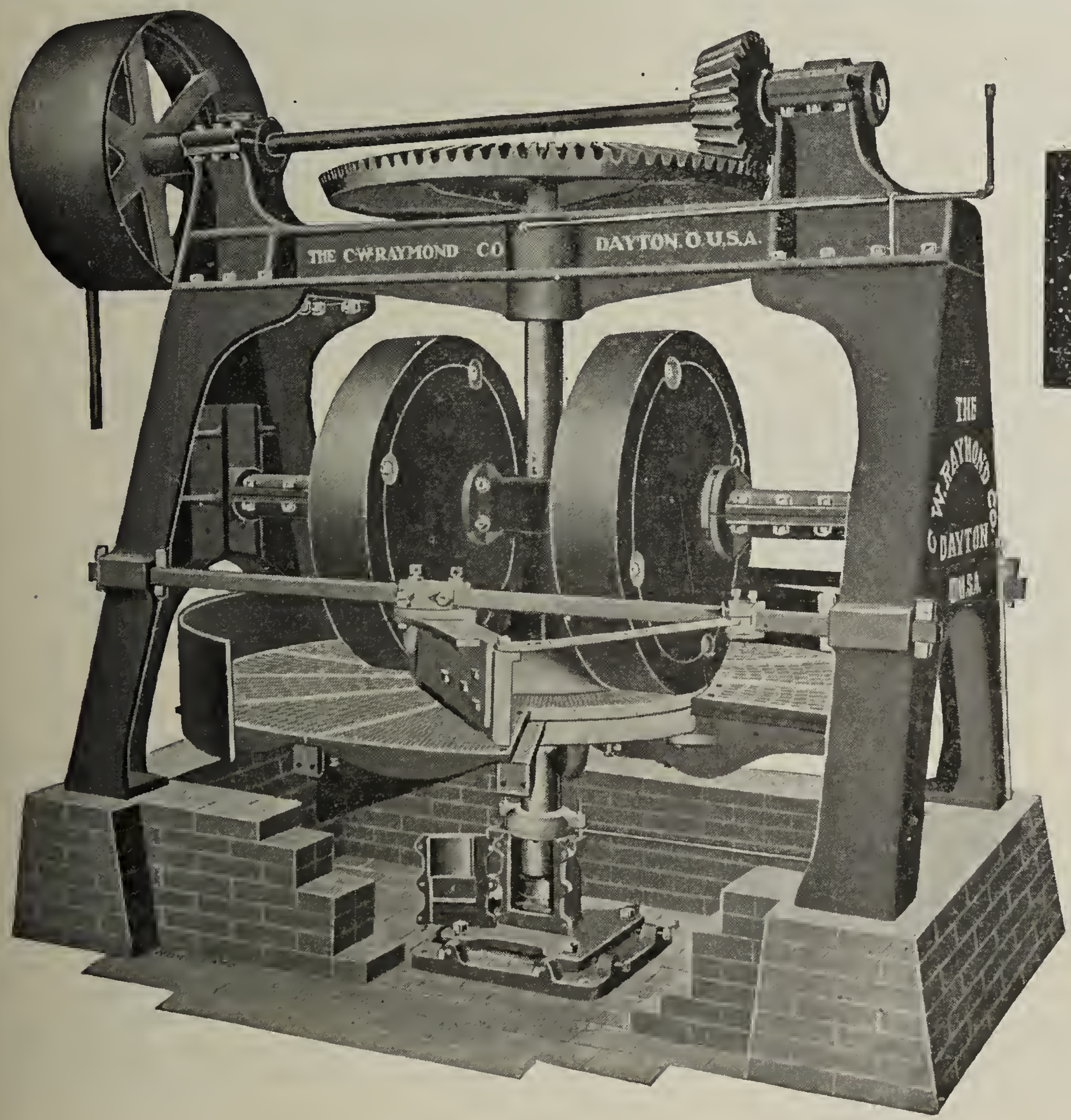
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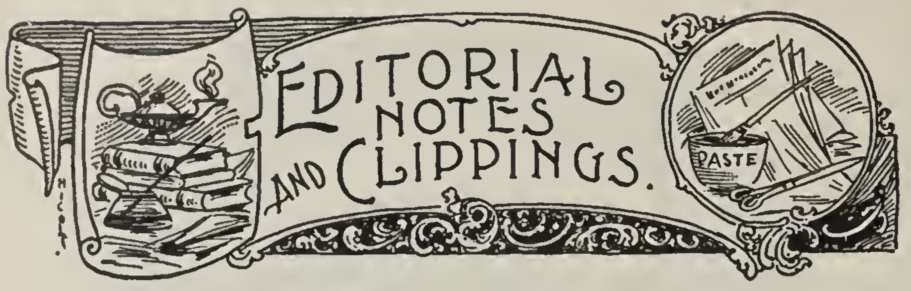

EDITORIAL NOTES AND CLIPPINGS.

TRUE HAPPINESS.

> True happiness consists in the
> Forgetting how to fret
> About the many things that we
> Are sure we cannot get.
> —*Philadelphia Press.*

Ambrose B. Judy has started a small brick plant at Danville, Va.

William T. Sutton will build a new brick plant at Table Rock, Ark., of 50,000 daily capacity.

L. Kissel & Sons will establish a brick plant at Hartford, Conn., of 35,000 daily capacity.

The Mineral City Clay Company has been incorporated at Moose Jaw, N. W. T., Canada.

The Mexico (Mo.) Brick and Fire Clay Company has been incorporated with a capital stock of $25,000.

The Somerset Brick Company has its plant at Somerset, Ohio, ready for operation. Jacob Mautz is manager of the plant.

Nelvin & Peterson, of Bradford, Pa., have started running and are getting along nicely and increasing their kiln capacity.

Adam Rogers, for many years a brick manufacturer of Macon, Mo., died at Columbus, Ohio, recently, where he had gone on a visit.

A. A. Scott, W. J. Oliver and A. McMillan, Knoxville, Tenn., will build a $50,000 brickmaking plant of 100,000 daily capacity near that place.

Sesvold & Olson have their new pressed brick plant at Galesville, Wis., almost ready for operation. It will be a model plant in many respects.

Clay has been discovered on the farm of Charles Temple, Hardin, Ill., and a company will in all probability be organized to develop the deposit.

The American Blower Company, Detroit, Mich., has just secured an order for installing a dryer at the pottery of Ransbottom Bros., Roseville, Ohio.

The Meek Brick and Tile Company, of Chillicothe, Mo., has been incorporated by J. E. and B. J. Meek, P. A. Follett and others. The capital stock is $50,000.

Work has been started on a modern fire brick plant for the Utah Fire Clay Company, of Salt Lake City, Utah. T. R. Ellerbeck is president and manager of the company.

The J. R. Cooper Brick factory at Independence, Ore., which has not been operated for some time, has resumed operations and expects to turn out 500,000 brick before the season closes.

The Trenton Tile Company, of Trenton, N. J., has been incorporated to manufacture brick and tiling by H. C. Smith, H. T. Matten, C. M. Wolz and George Wolz. Capital stock is $40,000.

The Medora Shale Brick Company has been incorporated at Medora, Ind., by George W. Zollman, C. V. Trautman and J. L. Hunsucker. They will at once erect a plant to develop their shale deposit.

A burning kiln of brick at the Greenfield (Ind.) Brick Company's plant collapsed recently, causing no little damage. Fortunately there were very few workmen about the plant at the time, so no one was injured.

George Hirsh advises us that they have a fine deposit of clay at Austin, Minn., which they would like to have developed, and Mr. Hirsh would like to correspond with any one looking for a desirable site for a clayworking plant.

The Mayo Brick and Tile Company has been organized with $100,000 to manufacture brick at Walhalla, N. D. C. W. Andrews is president, J. T. Briden secretary and treasurer, and H. A. Mayo, superintendent. The stockholders are Brown Bros., Aberdeen, S. D.; P. C. Donovan, Neche; John L. Cashel and W. C. Lestikow, Grafton; O. H. Johnson, Hamilton; N. C. Young, Fargo; W. J. Kneeshaw, Pembina; W. F. Winter, Langdon; T. R. McLaughlin, Walhalla; E. G. Valentine, Breckenridge, Minn., and the officers first mentioned. The company owns 1,800 acres of land and has purchased machinery and expects to be turning out brick within a month.

The Victor Pottery Company has been incorporated by H. W. Wass, Jenkinson, Pa., and Edwin R. Cockran, Jr., Philadelphia, Pa., with $100,000 capital stock.

Jackson, Minn., wants a tile factory. They have good clay and fuel and a good market for tile. Parties interested are requested to write H. L. Strom, Jackson, Mich.

The Douglass-Whisler Brick Company, Beaver Falls, Pa., has obtained a large order for face and ornamental shapes and has purchased a No. 2 Perfection Hand Repress from the Raymond Company.

C. U. Barlow, president of the Novelty Pottery Company, 1162 East Twentieth street, Oakland, Cal., writes that they contemplate adding a line of electric supplies and are in the market for machinery for moulding electric clay thimbles, knobs, etc.

Articles of incorporation have been filed by the Hastings Pressed Brick Company. The capital stock is $50,000 and the paid-up capital $15,000. The incorporators are W. J. Hynes, C. B. Wahlquist, C. B. Tyler, A. H. Farrens, C. B. Hutton, J. F. Scott and A. L. Clarke.

Huntingburg, Ind., is to have a new clayworking plant. A. Stratman, J. W. Lewis, J. V. Stimson and others are interested in the enterprise. A company with $30,000 will be capitalized at once, and a plant erected for the manufacture of pottery ware, sewer pipe and other clay products.

Ben J. Habel has traded his brick and tile factory at Rossville, Iowa, to Charles Allen, W. B. Redden, John Hollenbach and S. M. Postlewait for 360 acres of land near Crookston, Minn. Mr. Habel will manage the tile factory during the coming month and will then go to Crookston to look after his new possessions.

The Morgantown Brick Company, Morgantown, W. Va., has purchased, through the Pittsburg office of the C. W. Raymond Company, a "777" brick machine mounted on steel skids and self-contained. This machine is one of the finest machines of its type, and far superior to the old "777" furnished by the Raymond Company.

F. W. Dennis, kiln and dryer builder, of Atlanta, Ga., writes us that these are busy days with him. He is at present remodeling the kilns of the Nansemond Brick and Tile Company, Norfolk, Va., and when he is through there he will go to Rocky Mount, N. C., where he will build one new kiln and remodel three for the Jeffrey & Rix Brick Company.

The Des Moines Clay Manufacturing Company, Des Moines, Iowa, manufacturers of hollow building tiles for exterior as well as interior construction, electrical conduits, etc., has been very busy this season, being hardly able to keep up with the demand for their product. F. C. Hubbell is president, O. C. Pixley, vice-president and superintendent, and I. M. Earle secretary and treasurer.

The Wm. P. Kelley Brick Company, of 1222 Farmers' Bank Building, Pittsburg, Pa., has purchased and is now operating the brick works at Blairsville, Pa. A splendid shale building brick of a deep red color is being turned out. They are shipping to various points. The works are under the management of Mr. John W. Hamilton, of Fairchance, an able and efficient brickyard manager.

Frank Stassel, aged thirty-six, died at the City Hospital, July 17, from injuries received by being caught in a claymixing machine at the works of the Chesapeake Brick Company, at Brooklyn, Anne Arundel County, Maryland. About nine hours previous Stassel was employed at the brick kiln, and was at work when his foot slipped and was caught in the large clay mixer. His right leg was ground almost into a pulp.

The Fiske Brick Company, at Dover Point, N. H., is installing a new machine for the manufacture of pressed brick. The new machine is being installed under the personal supervision of E. P. Raymond, of the C. W. Raymond Company, of Dayton, Ohio, and when in working order the daily output will be increased about one half. The plant is taxed to its utmost capacity at the present time to fill its orders.

The New York Blower Company has issued another number of their sectional catalogue. It is No. 51, and deals with Peerless Blowers and Exhausters. It shows a line of compact, neat and substantial fans of the smaller sizes. These are the fans that have been used extensively by the United States Government for ventilating ships. They are also used a good deal for the pneumatic transportation of wool and cotton, for which purpose they

[CONTINUED ON PAGE 174.]

The "Big No. 6" "Monarch" Brick Machine.

OVER
175
"Monarch"
Brick
Machines
in use.

OVER
500
"Quaker"
Machines
in use.

WRITE
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regarding
Disintegrators,
Pug Mills,
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Smooth-roll
Crushers,
Moulds,
Barrows,
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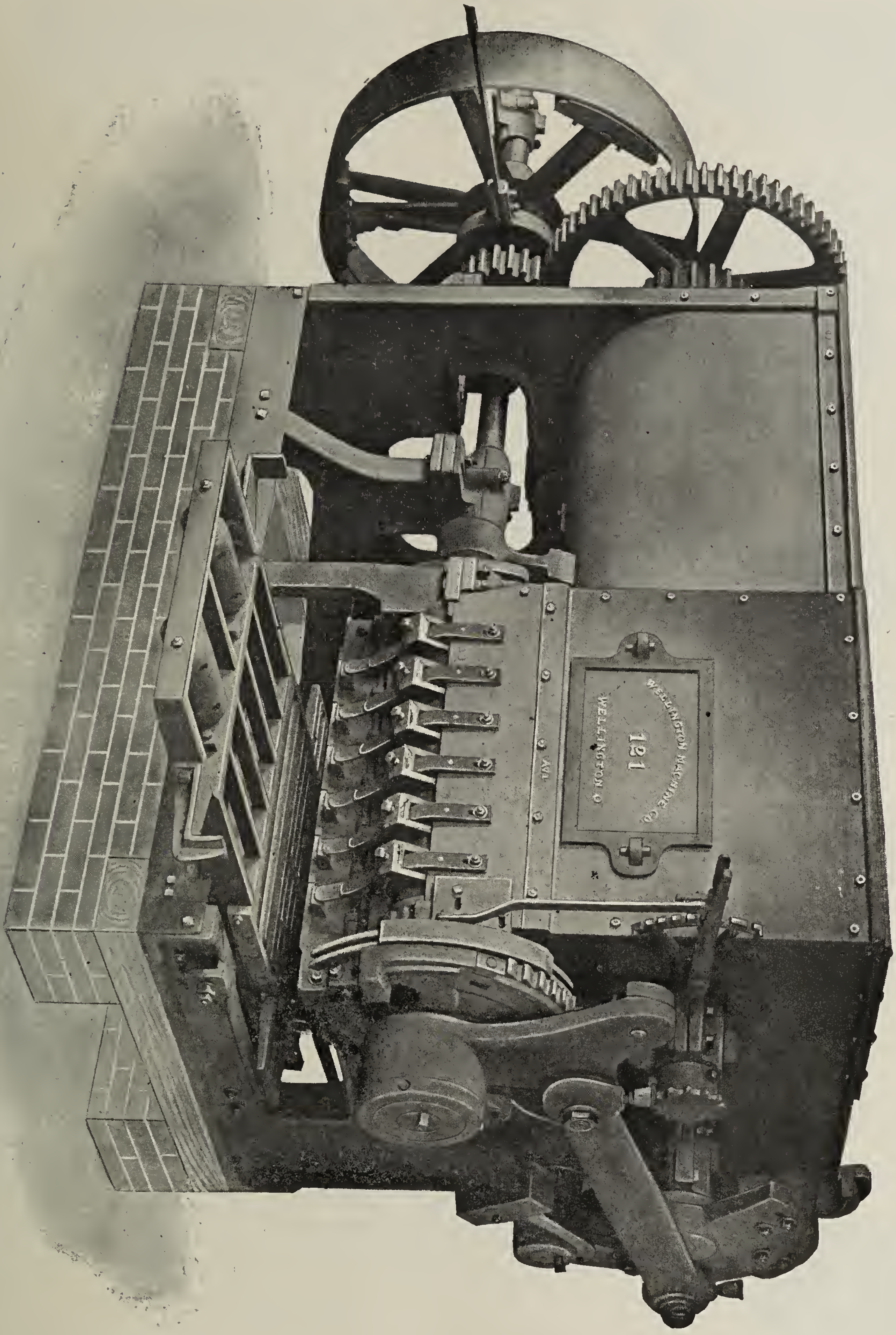
Winding
Drums,
Dump Carts,
Elevators,
Dump Tables
and all
kinds of
Kiln
Castings.



REMEMBER:
You are losing money wheeling brick unless you have our
ROLLER-BEARING BARROWS.

The Wellington Machine Co.,

WELLINGTON,
OHIO.

Send for Catalogue.

EDITORIAL NOTES AND CLIPPINGS—Continued.

are especially constructed. The catalogue may be had upon application to their temporary office, Twenty-fifth Place and Stewart avenue, Chicago.

The Ridgway Press Brick Company, Ridgway, Pa., is reporting good business and doing considerable shipping, more especially to the East.

Joseph Ganter, brick manufacturer, of Pilot Grove, Mo., is investigating the clay deposits at Sedalia, with a view of establishing a brick plant there.

It is reported that a company is shortly to be organized to manufacture brick in North Bend, Ore. The brick will be made from ocean sand. It is said that the company will be incorporated for $50,000.

The Central Ohio Roofing and Brick Company, of Columbus, Ohio, has been organized by W. G. Worcester, J. F. Worcester, A. V. Bleininger, R. F. Jones and Wm. M. Jones, with $30,000 capital stock.

Action has been commenced against the Troy Brick Company for damages resulting from the death of David Reilly and Edward Daley, who were killed June 3, 1904, by the landslide at the defendant's brickyard at Troy, N. Y.

The Volant Clay Manufacturing Company, Volant, Pa., has purchased a combination outfit, consisting of a 9-foot Pan, No. 2 combination brick machine, automatic cutter, represses, etc., from the C. W. Raymond Company, through their Pittsburg office.

The Mexican Sewer Pipe Company has been organized at the City of Mexico, to take over and increase the capacity of the Mexican Clay Company's plant, at Santa Julia, Mexico. J. H. King, of New Haven, Conn., is president of the new company. A change will be made from steam to electrical power.

In remitting subscription to The Clay-Worker, Ewald Bros., Granite Falls, Wash., write that last year they operated a small horse power yard, and that they own one of the best sites for a brick plant near Seattle and expect next year to build an up-to-date plant, equipped with modern machinery throughout.

The Concordia Hydraulic Stone and Brick Company has been incorporated in Concordia, Kansas, with a capital stock of $7,000 and the machinery has been ordered for a plant to manufacture artificial stone from shale and cement. The stockholders include C. R. Scott, president; T. J. McCue, secretary; C. A. Betournay, treasurer. They will later take up the manufacture of brick.

Alexander R. Batley, well known to clayworkers throughout the country, is now permanently located at Pittsburg, Kan., and, as will be seen by his ad. on page 122 of this issue, will devote his time to examining and testing clays, designing and erecting new clayworking plants and remodeling old ones. He advises us that there are splendid openings for the manufacture of building block, fireproofing, conduits, sewer pipe, etc., at Coffeyville, Independence, Chanute and Altoona, Pa. He will be pleased to give interested parties full information.

Work on the new plant of the Hayes Run Fire Brick Company, located at Hayes Run Station, near Mill Hall, Pa., is progressing rapidly and they expect to be in full operation early in September. Ellis Orvis, of Bellefonte, Pa., W. I. Harvey, of Flemington, Pa., and T. M. Stevenson, of Lock Haven, Pa., are the leading spirits in the enterprise. The company has an abundance of excellent fire clay and a vein of coal sufficient to supply the works for a long series of years on their own lands adjoining their works. The mines are opened within three miles of the works. A tram road is built from the mines to the head of an incline plane, which is about 700 feet long and which conveys the clay and coal right into the works. The machinery is now all on the ground and being rapidly placed. The capacity of the plant when running full will be 35,000 per day.

A new plant which is being built at the Great Kills Creek, Staten Island, N. Y., is that of the Richmond Brick Company. This will be one of the most modern brick plants in the country. The buildings are entirely of brick and steel, not a piece of wood being used in the construction of the plant. The machinery being installed is of Raymond make, consisting of two large clay separators, 12-foot pug mill, "999" brick machine with rotary automatic cutter and Victor represses. The dryer and waste heat steam system is of improved pattern and is entirely the design of the Raymond Company. When completed it is expected to be a model plant of this type. It will have a total daily capacity of from 80,000 to 100,000 brick. The kilns will be of the down draft type, and the plant is located on the water's edge, where a spacious dock will enable them to load boats and ship right into New York and Brooklyn.

The Meek Brick and Tile Company has been incorporated in Chillicothe, Mo., with a capital stock of $50,000.

The Hanstings Pressed Brick Company has been incorporated in Hastings, Neb., with a capital stock of $15,000.

David Atherton and Joseph Barnes, of Philipsburg, Pa., contemplate the erection of a $50,000 plant at Bigler, Pa., for the manufacture of tile and brick.

The J. R. Cooper brick factory, at Independence, Ore., will resume work at once. The output will be at least 400,000. Considerable brick will be consumed at Independence during the summer for building purposes, besides a large amount of hop house flues and hop kilns.

William T. Hilton, Ralph Hilton, George R. Mitchell, James S. Taylor and William Johnston McKay, all of Newburgh, N. Y., have organized a company to manufacture sand-lime brick, and have bought a part of the Verplanck property, on the river shore at Newburgh, and will erect a manufacturing plant there. The company is capitalized at $30,000.

R. T. Silox was quite badly injured by an explosion of natural gas at the brick plant at Chanute, Kan., which occurred while he was lighting the furnace fire. The force of the explosion wrecked one of the walls of the room and threw Mr. Silcox out of the room, breaking his leg. His face and arms were badly burned. The explosion was caused by an irregularity in the pressure of gas.

A tile factory project is proposed by prominent business men of Montalvo and Oxnard. The factory will probably be located at Montalvo, Cal., where the brickyard now is. Mulhardt Bros., prominent and wealthy ranchers, are looking into the matter and undoubtedly will act in conjunction with Carl Westerheider, the proprietor of the brickyard. The factory will pay considerable attention to sewer pipes, etc., which will be used in great quantities in Oxnard and Santa Paula, Cal.

The Wallace Manufacturing Company, Frankfort, Ind., write that trade has been exceptionally good with them throughout the season, and there is no prospect for a dull season this year. They have been running their plant to its full capacity for months past, and now have orders ahead sufficient to keep them going till late in the fall. They have recently booked orders for brick and tile machinery for Charleston, W. Va., Colgate, I. T., and Monmouth, Ill. The fact that the demand for "Wonder" machinery increases steadily and continuously speaks volumes for its merit.

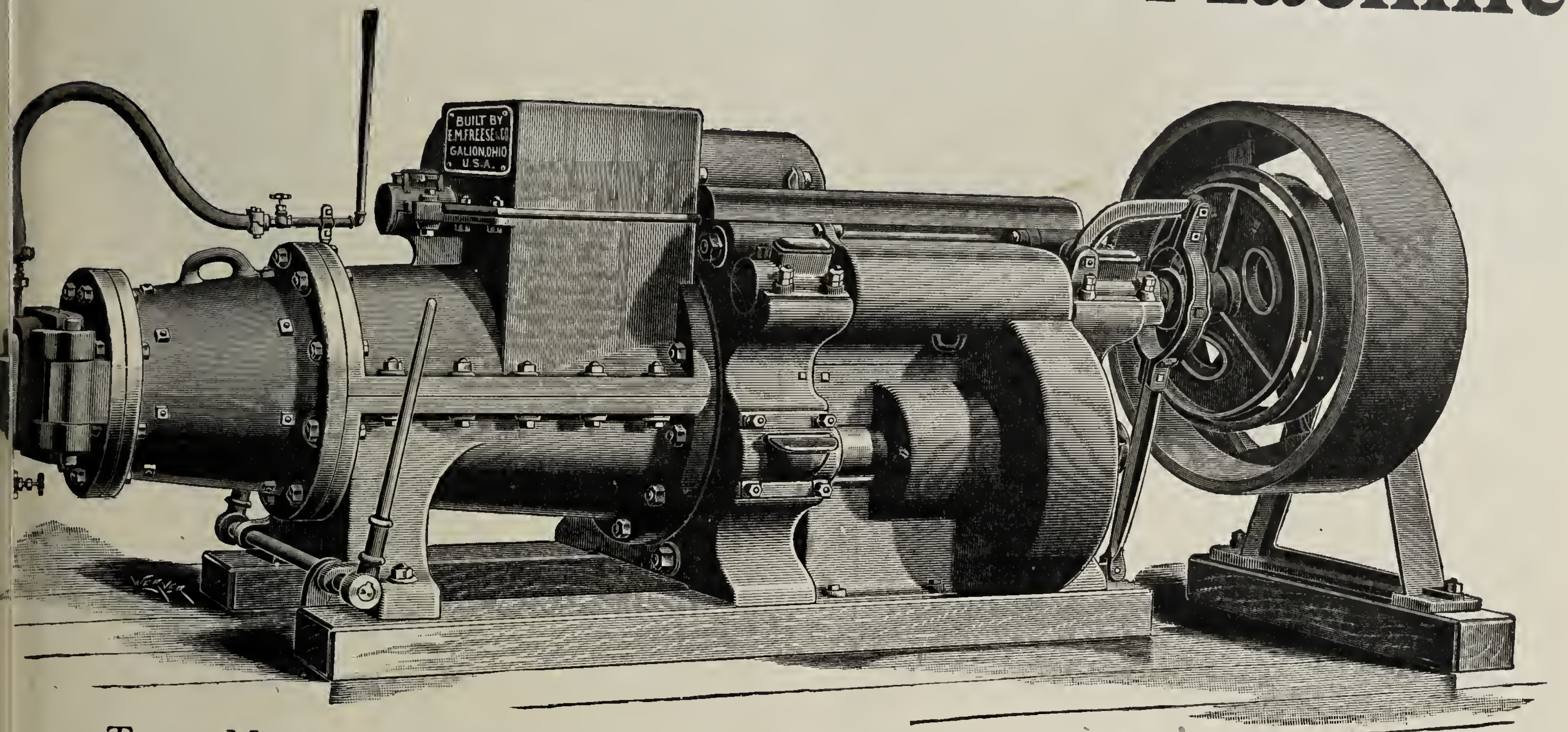
Mr. Charles W. Raymond, Jr., who for the past two years has been located in the Pittsburg office of The C. W. Raymond Company, has been transferred to their St. Louis office, No. 315 Frisco building, and his place in Pittsburg has been taken by Mr. I. M. Justice, who for years has been connected with The C. W. Raymond Company. Mr. Justice will for the present continue to do business in the Pittsburg office. The brickmaking fraternity of Pittsburg and vicinity regret exceedingly that Mr. Raymond has been taken from this territory, as he was very popular and made hosts of friends every place that he has been, and has carefully watched the interests of the company whom he has the pleasure to represent.

The present season is one of great activity with the Dickinson (N. D.) Fire and Pressed Brick Company. Orders for April, May and June averaged 70 per cent. greater than for the corresponding months of last year, and it was supposed that 1904 would be an off year in the building line. The company originally started out to manufacture brick only, but Superintendent Russell soon discovered that there was also a splendid field for ornamental work, boiler settings, pottery, tiling, etc. Several crews are now kept busy with ornamental and special shape work. A few weeks ago a man in the company's employ who had worked at the business in the Old Country, was allowed to mould and burn a quantity of pottery. His efforts were very successful, and in time it is expected that this branch will be given more attention by the company. The output of this company last year was equivalent to 3,000,000 brick and it will be considerably more this year.

A MESSAGE FROM HORSEHEADS.

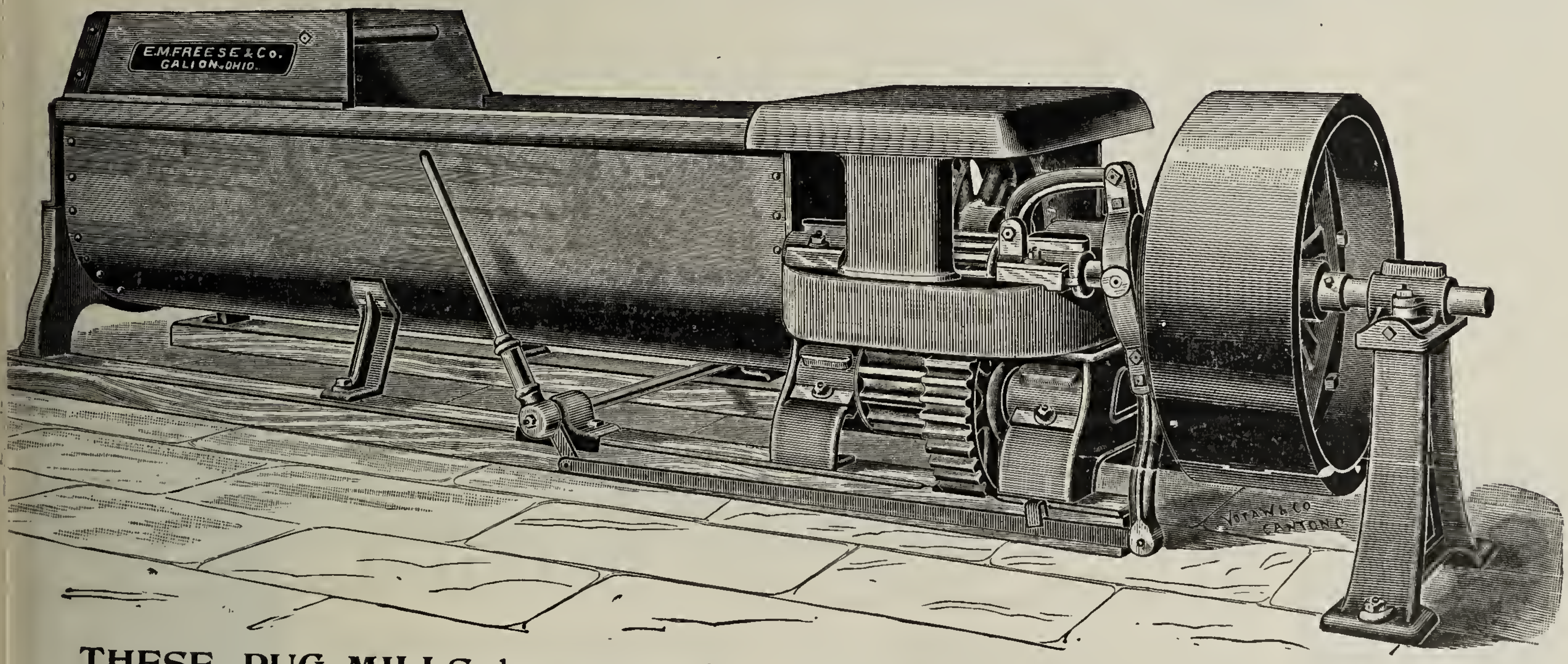
The letter from R. G. Eisenhart, ex-president of the N. B. M. A., on page 121, tells an interesting story. The success of the Williams Pulverizer on the Horseheads yard is proof positive that it can be used with equal benefit by manufacturers of building and paving brick generally. Mr. Williams, "the Pulverizer man," solicits careful investigation and is prepared to do what is now commonly expected of every Missourian.

Our Mammoth Brick Machine


BUILT BY
E.M.FREESE & CO.
GALION, OHIO
U.S.A.

THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

Our Pug-Mills Have Features of Great Merit.


E.M.FREESE & Co.
GALION, OHIO.
VOTAW & CO
CANTON O

THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 212 and 213.

Written for The Clay-Worker.

ST. LOUIS BRICK AND BUILDING NEWS.

BUILDING BUSINESS is again assuming its normal proportions in the city. The antipathy that was shown a year ago by builders against beginning new work has disappeared and buildings are in the course of construction in nearly all the residence sections of the city. Modest dwellings and flats are in the lead, numerically, but an unusual number of business houses are under construction in the western sections of the city. In addition to these, quite a number of new business buildings and warehouses are being erected in the old sections of the city east of Fourth street. A year ago nearly all of the residence building operators were doing nothing and very few permanent buildings were under way. Now because of the encouragement given by the good demand for good residences, they will build as speedily as possible in order to secure the advantage of present conditions. Many others who have been contemplating building for some time past are now induced to go ahead with their enterprises by the decline in prices of building materials and the better tone of the labor market.

The Master Builders' Association discussed wage reduction at a meeting held some days ago, but came to no agreement on a wage scale. The wages are still above the union standard and each contractor is making the best terms he can with the workmen. An officer of one of the unions, when approached relative to a new scale of wages some days ago, said that it was now up to the master builders to make demands. The wages, he said, were raised through the demands of the workmen, but now the conditions were reversed.

Up to the present time building operations have been retarded to some extent by the lack of workmen, as a large number have been employed on the World's Fair grounds and in that vicinity. This fact is preventing large numbers of the flats and dwellings from being completed in time to be benefited by the World's Fair rentals. Many buildings are now under way, will not be completed until toward the close of the World's Fair.

A leading builder, in discussing the situation, said: "All the conditions warrant the belief that St. Louis is on the eve of a big building boom. The development of the southwest has commenced in earnest and St. Louis, its metropolis, has increased and will increase in manufacturing and business accordingly with a corresponding increase in the population.

"Residential building has not kept pace with this industrial advancement, because ten years ago the town realized that it had been somewhat overbuilt, prices lagged and capital surrendered to the better inducements offered by the rapidly developing commerce and manufacturing of the city. This was aggravated by the increase in the cost of building, generally attributed to the World's Fair. But now we find ourselves almost at the close of the Fair without residences sufficient to satisfy the actual needs of our permanent residents, many of whom are 'doubled up' with relatives and friends.

"Of course, I recognize that part of this extreme congestion is due to the number of World's Fair followers in the city, but the effect of their presence is largely overestimated; I believe that the temporary hotels and other buildings easily accommodate them, and they will be torn away after the Fair. The situation thus presented with its opportunities for profits offers tempting inducements to conservative capital."

The report of the building commissioner for the month of July shows that there is a decrease in the erection of brick structures and a slight increase in the erection of frame buildings over July of last year.

During the last month 119 permits were issued aggregating $826,725. The cost of brick construction during the year 1903 aggregated $1,344,297.

Frame building during the month of July, 1904, exceeded that of 1903, the latter year's permits aggregating $45,255, against $63,994 for July, 1904.

The total cost of construction for July of 1904 was not as large as that of 1903. During the latter year all buildings work aggregated $1,471,806, while last month building aggregated but $994,874.

All the brick yards are fairly busy. They are getting ready for the rush expected later. Many inquiries are being made as to prices, etc.

The Meek Brick and Tile Company of Chillicoth, Mo., has been incorporated with a capital of $50,000, one half paid-up. The incorporators are J. E. Meek, B. J. Meek, P. A. Follett and others.

Louis Chauvenet, for many years connected with the Hydraulic Press Brick Company, but recently associated with the New Union Sand Company, died August 2, at Pittsfield, Mass., where he had a beautiful summer home. He leaves a widow and a son nine years old.

The Consumers' Brick and Quarry Company, of this city, filed a statement recently showing that it had made a decrease in its capital stock from $40,000 to $20,000. The assets are given at $25,173.64 and its liabilities at $5,100.43. A. Saint.

NITROGLYCERIN.

Nitroglycerin, the strongest practical explosive known, was discovered by an Italian chemist, Sobrero by name, in 1846. As nitroglycerin is not safe to handle it is usually used in dynamite, which is prepared by kneading together 25 per cent. of infusorial earth and 75 per cent. of nitroglycerin until it assumes a putty-like condition resembling moist brown sugar. Nitroglycerin, if placed on the wrist or tongue, has the peculiar effect of producing a violent headache. It has a sweet, aromatic, rather pleasant taste, but cannot be classed as particularly healthful food.—*Four-Track News.*

ALPHA CANVAS BELTING.

costs less than rubber or leather—lasts longer—does better work—stretches less—is stronger, and runs true from the very start. Can you afford, in these days of economy, to ignore it?

THE AMERICAN BELTING CO., Youngstown, Ohio.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XLII. INDIANAPOLIS, IND., SEPTEMBER, 1904. No. 3.

ADOBE BRICK OF MEXICO.

Ancient Methods and Customs That Make Our Neighbors on the South Very Interesting to Travelers.

ONE OF THE MANY THINGS that go to make Mexico so picturesque and so interesting to foreigners is that it still retains many of the customs of past generations which modern nations have left behind them. These seem to fit in with the strange half-Moorish, half-Aztec aspect of many of the old buildings which are found everywhere throughout the country. The landscapes, too, in the many-colored mountains, the wonderful lights on the hills and the picturesque natives all seem to blend with the curious old customs of a past age which have lived on here into the rushing civilization and restless energy of the twentieth century.

Making Adobe Brick in Mexico.

In the rural districts many of the natives are doing now as our ancestors did more than a century ago, before factories and the steam looms came to centralize work that had been previously done in the homes.

Many of the Indian tribes still keep their ancient languages, their distinctive dress and their customs and superstitions of their ancient religion, if not the spirit of the religion itself. Among these the primitive customs referred to above are more often to be found as they existed centuries ago.

The Indians who cling most closely and tenaciously to their ancient dress and language are those who are most interesting to study, and picturesque, from the tourist point of view. These tribes do all their own weaving at home. You can tell each tribe by the distinctive dress it wears. Especially is this so of the women, for, like the Highland Scotch, they have certain ways of weaving their cloth peculiar to each tribe. The tribe is generally indicated on the uplands by certain stripes. Sometimes, however, it is shown by having a skirt of one kind and a reboso (kind of shawl) of another.

In many Mexican houses women spin on curious, antique-looking wheels as their ancestors did before the Spanish conquest four centuries ago. Almost all the cloth made in the Mexican homes is of cotton, and in many places they will tell you proudly that the art has remained in the family since the time of the Aztec princes. The cotton yarn is dyed in many colors and woven into artistic patterns. The curio stores make a very profitable business selling the more artistic of the blankets and different kinds of wraps of the Indians.

One of the sights of interest for the tourist is the making of matting from rushes. This is to be found in many different patterns and colors, from the very coarsest class to the fine variety which is often used by the middle class people in the place of ordinary rugs and carpet. The long rushes from the swamps are partially dried and then woven into mats, while they are still pliable enough to be worked without injuring the fiber. Many poor people make a living by the manufacture of these rush mats, which serve the place of bedding for the poorer classes, who stretch them upon their earthen floors to protect themselves from the damp.

On the most curious and primitive looms Mexican women weave saddle-girths. These looms consist of upright sticks fastened into a rude crossbar. Generally two women work at this loom, one working the woof, while the other handles the warp. the threads, which run lengthwise, are made so that each alternate strand can be raised or lowered past its fellow, as in the ordinary loom; but as one woman has to stay at one end to raise and lower strands its requires another to pass and repass the cross-threads. It is surprising what pretty designs are often worked out on these primitive looms. Outside the customs are as primitive as they are in the house. In many places crops are obtained by irrigation. The water is carried in open ditches, often across an almost level country. And any morning or late afternoon one may see the Indian laborers throwing water by hand from the ditches upon the land.

The plowing here is also as primitive as the irrigation. It is generally done with oxen, and the plow consists of a long, rudely fashioned wooden stick, which, more properly speaking, scratches the earth, for by no courtesy can it be called plowing.

Here, too, one may see the dusky natives making the biblical sundried bricks, which are held together with straw. These are made of certain kinds of tough earth, which are mixed up with plenty of water, until the mixture resembles rather thin mortar. Cut straw is then added to this mass. When this is well mixed it is ready to be turned into bricks. This is a very simple process. A frame, generally 24 by 18 inches, is used. This is divided by a crossboard into two equal parts. It is placed upon the ground and filled with the wet earth mortar. The top is leveled off and the frame lifted, leaving two soft black bricks several times larger than an ordinary American brick. A skilled dobero (as the brickmaker is called) will make from 100 to 300 bricks a day. These bricks are left a couple of days to dry, with perhaps one turning. Then they are dry enough to be turned upon edge, which allows them to dry much faster.

Until a few years ago the greater part of the building in the interior towns of Mexico was done with "adobe" or sun-dried bricks. And there are good-sized towns here in which 90 per cent. of the buildings are still of this material.

Some of the sights in the cities are about as primitive and picturesque as those of the interior villages and towns. One of these is the street restaurants. These may be found in every town in Mexico, but they are more in evidence on feast days. At Guadalupe, the holy city of Mexico and the home of the patron saint of the Mexican people, these restaurants may be seen by the dozens during the month of December, when pilgrims make their pilgrimages to the shrine.

All that is requisite for one of these restaurants is a brasero, or small earthen stove and an earthen pan or two, upon which are cooked all kinds of things the Mexican Indian and lower-class native of the towns and cities like. And primitive and often uninviting as these things look to the unitiated, they are by no means to be despised by a hungry person. This same primitive means of cooking the Spaniards found in the country when they first landed here. And one of the rough old conquerors tells us how the soldiers soon came to like the cooking of the simple and primitive natives.—By Peppe Roy, in *Modern Mexico*.

PUBLICITY AND POLITICS.

Politics will not have much influence on business transactions this year. There will be no advertising appropriations held up pending the result of the presidential election, nor will there be threats of a general shut-down of industries, as there were in the last two campaigns. The platforms and candidates of the great political parties are satisfactory to our business interests. The Republicans promise to continue present policies and to keep the prosperity mill running full blast. The Democrats tried hard to give their end of the proposition a dubious aspect, but a certain terse telegram caused them to see a new light, and the dangerous element was promptly and effectively squelched. As a result, the business outlook will not be materially affected by the success of either party, which means that there will be very little hesitancy on the part of advertisers in pushing forward plans for the coming season's campaigns. That conditions should be so favorable to business enterprise in a presidential year is as unusual as it is gratifying. It augurs well for the future, and strengthens the belief that the end of our era of prosperity is not yet in sight.—*Profitable Advertising.*

It is better to borrow money to buy a new machine than to lose money trying to operate an old one.

Written for The Clay-Worker.

A BRICKMAKER ABROAD.

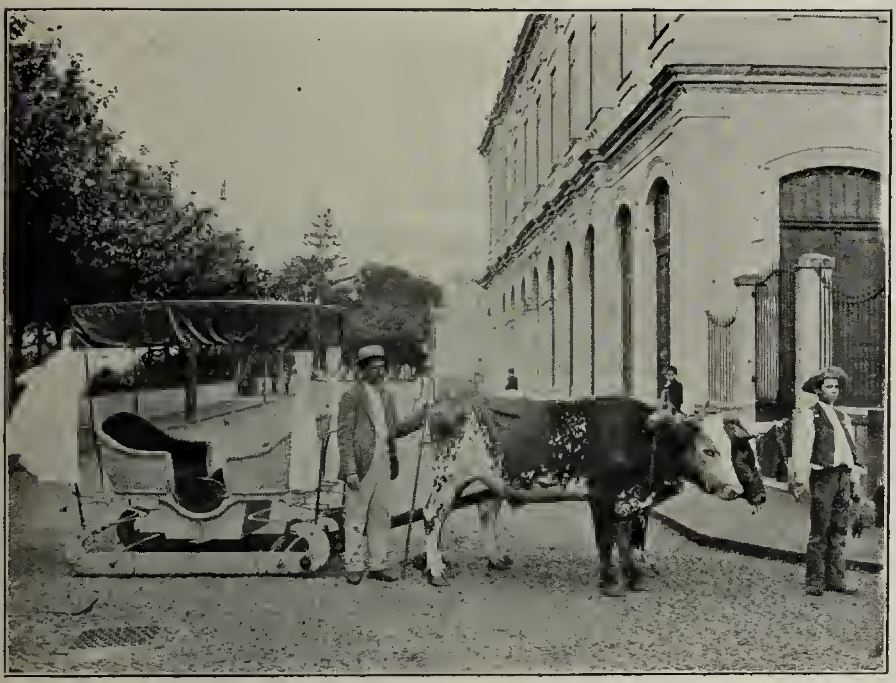
Interesting Observations of a Participant in the Great Pilgrimage to the Holy Land in 1904.

LIVES THERE A SOUL so dead that has not wished in his heart that some day he might visit "the land of song and story," the "land of the Book," the land of all this great beautiful world chosen to be the birthplace of the Savior of all mankind? Perhaps it has not been thought of by many because it seems an impossible thing, as it did to us when two years ago circulars commenced coming through the mail advocating holding the next World's Sunday-school Convention at Jerusalem. It seemed impossible, an impracticable thing, and when it was spoken of at the International Sunday-school Convention in Denver, it seemed farther away than ever. How could such an *immense* undertaking be carried out? But the ball was set in motion and kept rolling. Especially was this so in Ohio, and, as every one knows, no State in the Union can ever outdo Ohio, so when the time came for the start, Ohio furnished more delegates than any other State or province. We left home March 4th, and sailed March 8th on the "Grosser Kurfurst,'" of the North German Loyd Company. As soon as we stepped on board all fear of the water vanished, and we felt a sense of security that stayed with us throughout the voyage.

The Cog-Wheel Railroad and Toboggan Sled.

It took several days to find the most direct way to our stateroom, to the dining-room, main deck, aft deck, upper deck and all the other "ins and outs;" in fact, we made new discoveries the last days of our return. It seemed a strange thing that before we started we were given the exact time at which we should land at our different stopping places, the time we should sail and with very little variation the itinerary was carried out. It was system about everything. We have understood why the ship's officers were so firm and positive in all their directions. Every man was kept busy, even the musicians having their work, and so this well-ordered floating city inspired us all with confidence, for there was no carelessness but business to the end, and I have no doubt the captain was glad when he had us again safe in New York. Not all the questions asked were strictly plausible, but the answers were invariably terse and to the point. Neither were all the cranks on that vessel used in turning wheels, but the officers and crew were patient and kind throughout. It cost two million dollars to build this ship. There were three dynamos supplying the electric power for 1,000 lamps, the motor in the cold storage and the motor in the laundry. An evaporator producing fresh water from the sea for feeding the boilers forty tons a day. A distiller for producing drinking water from sea water, twenty-four tons a day. Three ten-ton ice machines for refrigerating rooms and provision stores, working by ammonia, one special tank containing 20 per cent. salt water, kept at zero by an ice machine. The steam for eleven machines is produced in five double-end and two single-ended cylindrical boilers, with thirty-five fires in all. The coal bunker, lying around and above the boilers, carries 2,000 tons of coal, and the daily consumption was from 150 to 160 tons. There are two main engines, both indicating 9,000-horse power. We had the wireless telegraph machine—in fact, the "Kurfurst was a marvel of up-to-date machinery, a constant wonder to those unused to ocean travel. And old travelers who had crossed the ocean more than thirty times said they had never been on a vessel so well equipped, so well taken care of, and had never sailed on so smooth a sea.

The table was splendid. It seemed that the stewart was determined we should have plenty to eat. After breakfast was served came sandwiches and beef tea at 9 o'clock, on deck; then lunch at noon, and in the middle of the afternoon lemonade and cakes were passed, dinner being served at 5:30 p. m., and any one desiring lemonade and crackers could find it in the aft dining-room at 9 p. m. Ice cream was served three or four times a week, a supply of which was taken on at New York to last the vessel six months. A fine band played forenoons, afternoons and at dinner. It seemed like a fair or some excitement all the time, so many passing to and fro. Even when the cruise was almost over new faces appeared that had not been noticed before. We only became acquainted with few of the 800 passengers to know and call them by name. On the cars between Philadelphia and New York we met Mr. and Mrs. Robert Ridgeway, of Amboy, Ind. Many of your readers will remember him as attending the Brick and Tilemakers Convention. Mr. Ridgeway was evidently much interested in geology, for he could ever be seen with his hammer, busy collecting specimens of rock wherever they were to be found.



A Bullock Sled, the Only Means of Conveyance in Funshal.

After sailing eight days, Wednesday, March 16th, found everybody in an attitude of expectancy.

About 10 a. m. land was sighted. The nearer we approached the more beautiful the island appeared; mountains rising out of the sea and out of the clouds with precipitous sides of most beautiful coloring. We soon came in sight of Funchal, the capital of Madeira island. What at first appeared to be white rocks were soon discovered to be white houses dotting the mountain sides. The bay is beautiful. Small boats with small boys came out to meet us, and we soon found this to be the place where diving for coin is practiced by the natives. We felt sorry for the poor little fellows, looking to be no more than five or six years of age, shivering, watching for a coin to be thrown into the water. A dive would be made and they would come up holding it between their toes. We were taken to land on steam launches, and found it the most tropical place we ever saw. Immense palms, banana trees, sugar-cane, heliotrope, verbenas, geraniums, begonias, roses and other plants were blooming everywhere. It was because we had not seen land for so long that Madeira seems so like an enchanted island. We were admitted to a Catholic cemetery and the decoration of the graves with flowers and pictures was a novel sight. We wandered up and down the narrow streets, a crowd of children following us, holding out their hands begging. Some had bouquets and, after trying in vain to make me buy, laid a bouquet on my arm or in my lap. Sleek, sleepy oxen hitched to sleds stood around as horses and cabs do in our cities. We got into one and went up the steep winding streets as far as the fort. I stood and looked out on the blue, blue sea, with the harbor full of boats of all sizes and description. Our ship was the largest of all and stood out conspicuously among all others. A great banner with the one word, "Jerusalem," stretched along its side. I shall never forget my sensation as I saw that advertisement of who we were and for what city we were bound. Many times I have wondered what effect our visit had upon these strangers. The city of Funchal has about 30,000 inhabitants. They must lead a simple life, as their shops seemingly have so little in them. A large sugar factory was in the center of the town, and wholesale wine houses, with their immense casks, showed that the "grapes of Madeira" were still growing. Many of the streets are not more than ten feet wide, and all are paved with cobble stones not larger than an egg, many being much smaller, put down in patterns and looking like mosaic. There are no sidewalks in these narrow streets, but the walking was not hard over the smoothly laid pavement. Some hearts went out in sympathy to the builders of these streets as they thought of the aching backs and the tedious time required. We did not see a street that needed repair nor one being worked upon, so concluded that when once laid these cobble stones were lasting. We felt like saying to the many idle men, "If you want work continually, pave your streets with asphalt; it will keep you busy repairing it."

High walls, plastered, rise on each side the street, and the houses are built on top or back in the garden. Heavy doors with knockers admit to the inside. The houses are built of stone or brick, and red tile roofing is the rule. We made all possible haste next morning for the mountain trains, but there were "many men of the same mind," and a crowd was already waiting. Here is a place where crowding does no good. A certain number of tickets are sold for each train, and you have to go on your turn. After waiting half an hour or more we got aboard and were carried up the mountain in a comfortable car at a reasonable speed. As we ascended we were amazed at the gardens on each side of us. Bananas, sugar-cane, grapes, cabbage, beans, etc., are grown on the same ground. Every inch is cultivated, and the flowers are not left out. Children tossed bouquets into the car and then ran along, keeping up with the train, holding out their hands, begging for a penny. The railroad ends in a beautiful garden and at an old monastery that is full of curious things. Most visitors go down on toboggan sleds, and although we had fully made up our minds to go back on the train, we did as others and took this novel toboggan ride. These sleds are baskets placed on runners large enough to hold two or three persons. Two strong men guide them, sometimes pulling in front, but most generally holding us back, and we went down over the cobbled street at a rapid rate. When the sled does not run easy a roll of greased gunny sack is laid in front of the runners and it helps amazingly. Our road was between walls. Interested faces peered down at us from the casements above. Some of the lovely children responded to our smiles with bouquets of beautiful flowers, thrown with a sweet and graceful little flourish that expects nothing in return. The streets are so steep that ridges are made in the paving as a sort of brake. We never expected to see so charming a spot as Madeira, and we sighed as we said farewell. It is like some other places in the world—cannot be described. Madeira is becoming quite a winter resort for the English people. The one automobile on the island was white, owned by an Englishman. It was indeed swell; no wonder a crowd followed it. We saw a number on horseback, with always one or two attendants running behind each horse. The animals were all fat and sleek—horses, oxen, cats and dogs. The people, too, were attractive, and, I thought, were we ever to be ship-wrecked, may it be off the coast of Madeira.

Next, Gibraltar, Algier and Malta.

Written for THE CLAY-WORKER.

ASPHALT AND BRICK.

The Street Pavements at the National Capital.

THE RECENT TROUBLE between Venezuela and the American and English asphalt producers again brings to mind the use for street pavements of the expensive material from Trinidad. The residents of big cities have gotten so used to seeing asphalt pavements that they accept them as a matter of course, without looking into their material faults, and without considering the municipal tax necessary to make this pavement possible. And there is another feature in this connection not usually taken into consideration—the fact that much money is sent out of this country in payment for asphalt, for export duty, labor, freight, etc.

It may not be well known that there are several places where asphalt is produced. Besides being largely obtained in the island of Trinidad, it is found in New Grenada, Mexico, Texas, France, Portugal, Ionian Islands, Syria, Caucasus, Crimea, Arabia, Persia, Burmese Empire, China and some other places.

The tenth Earl of Dundonald seems to have been the first to bring Trinidad pitch into commercial notice. In the year 1851 he leased for twenty years a large part of the pitch lake on the island and some of the adjoining asphalt land, and in 1865 assigned his lease to a joint stock company called the Trinidad Petroleum Company, organized principally for the purpose of distilling petroleum from the asphalt.

From 1866 to 1891—taking the most recent available figures—the exports of Trinidad asphalt amounted to 782,311 tons, including all kinds, lake and land, boiled and raw pitch. It was estimated some years ago that the pitch lake alone contained about 4,752,000 tons of this material.

Trinidad asphalt is mainly deposited in and near the village of La Brea in the southwestern part of the island, about forty-five miles south of the Port of Spain, in the Gulf of Paria. There are other deposits of asphalts on the island, but these are not being extensively worked. The pitch lake is a most peculiar feature of the island; its area is 109 acres 9 perches, and has an elevation of 138½ feet above high-water. It has been described by a number of writers, one of which, Mr. W. P. Pierce, Consul at Trinidad, in 1892, says, in part:

"Persons who have seen a large, round pond, substantially dried up, with little strips of clear water irregularly intersecting its bed, here and there patches of vegetation and a slushy-looking place near the center with fish-bubbles coming up, the entire bed blackish and uninviting, can form a very fair idea of the general appearance of this famous lake. An odor described to be like that of sulphurated hydrogen gas is emitted at the sloppy-looking place, called "the place of supply." * * * There are also over the lake more or less little swellings of different shapes and sizes, the smaller of them containing only gas, and some of the larger (say a foot square) containing both gas and decayed vegetation.

"There are a large number of land islands over the lake which would probably aggregate about three or four acres. They are covered with vegetation and some support trees twenty or thirty feet high, but I am told these islands do not come up from the bottom of the lake, nor do they bear down any considerable distance in it. * * * A horse may be ridden on the lake and up to the "place of supply," and, under particularly favorable conditions, I think he may be ridden through it."

In speaking further of this "place of supply," Mr. Pierce says: "In an open space, say fifty acres, in which there is no vegetation, may be seen a zig-zag, irregularly outlined spot, which undergoes constant change in shape and size. It differs from the surrounding pitch in outward appearance, as freshly-molded or bright lead would differ from lead of a duller and darker hue. All of this fresher looking pitch is softer than the pitch surrounding it; but on some of it, at the more distant edges, one may walk without sinking below the heel of his shoe. Within this particular area is located the "place of supply," which is one or more spots where the pitch is always softer and where, in the hotter part of the day, the pitch, or, rather, the water surrounding it, fairly boils."

It is stated that the pitch of this stygian lake is in constant motion, and that each of its divisions—divided by the little water courses mentioned—has a motion of its own.

Although so much asphalt has been shipped from La Brea and vicinity, there are few conveniences for this work. There is a pier, but only for flat boats, which take the asphalt to the transporting ships. The crude asphalt—dug up with a pick or, when very soft, with a shovel—is carried in baskets or tubs from the shore to lighters, the carriers walking on a gangway.

Washington, D. C., remarkable for its streets and grand avenues, affords as instructive an example in the use (or misuse) of asphalt as can be found in the United States. The paved streets of the city and it's suburbs represent an area of 8,115,994 square yards. This includes—estimated in square yards—the following material: Asphalt and coaltar, 2,886,786; asphalt block, 471,461; vitrified block, 16,846; granite, 561,195; cobble, 222,779; macadam, 1,314,298; gravel, 2,642,629.

It will be seen from this statement that there is an immense street area in the District of Columbia that is not yet covered by asphalt. And here is a splendid opportunity for the employment of good street paving brick—if the District of Columbia authorities would only give brick a fair show. Brick, laid with a good cement joint, have been tried here, and have demonstrated their excellence for the purpose "experimented" for. As for asphalt—one might say upon looking over a newly-laid street pavement of this kind: "This is excellent." But it is "excellence" that cost much money and does not last in "excellent" form. It must be often repaired, and if left alone, in a few years looks, with its cracks, hills, hollows and broken places, like the surface of the pitch lake where much of it came from.

From the last District of Columbia report on streets it is gathered that there were 2,872 dangerous holes repaired in streets, avenues, alleys and sidewalks, two-thirds of this work having been done on street roadways. The far larger percentage of these dangerous holes have to do with asphalt paving. This material has a decided tendency to rot wherever water accumulates upon it, and breaks up, leaving an ugly, dangerous hole, when the break is a larger one. Streets here paved with this material have already cost the people of the District—and of the whole country—over five millions of dollars. People say this is a clean city—on account of these asphalt streets. Apparently so, after the water cart and street sweeper have done their work. But brick are cleaner; they give off little or no dust from disintegration or abrasion, as does asphalt; and the dust from the latter is injurious to the health. Pulmonary disease leads as a destroyer of people in Washington, and it is highly probable that asphalt dust is one of its agents, in direct effect and as a germ carrier.

Another well-founded objection to asphalt as a paving material is in the manner of keeping such streets in repair. When a hole or hump is in need of mending, a space larger than the offending spot must be chopped out several inches deep; material is then packed in, beaten down and gone over with a heavy roller. While this is going on the hot asphalt mixture is waiting, and, incidentally, giving off its nasty odor, which has a long range and forceful effect.

The street mileage in the District of Columbia is, for all kinds of paved streets, 447.53 miles. Of this 128.3 miles are paved with asphalt and coaltar; 21.87 miles asphalt block, leaving about 297 miles that will some day be either covered with asphalt or better material than at present used. Why should not the streets of the Capital City be clothed in the beauty of serviceable, healthful brick? Why should not the home product be used in the great capital of the Home?

It can be stated as a positive fact that brick can stand the wear of heavy street traffic, and they make the most beautiful of pavements.

RUBBER PAVING IN LONDON.

THE following particulars regarding the rubber paving of the two roads under the hotel at Euston Station, London, may be of interest. This paving was laid in 1881 by Kirk & Randall, the contractors for the extension of the hotel. Its cost per square yard was as follows: Concrete foundation work, $5.60; rubber paving, supplied by Messrs. Macintosh & Co., $27.10; total approximate cost, $32.70.

New Jersey Avenue, South of U. S. Capitol, Where the Old Brick Sidewalk Looks Much Better Than the Ragged Block Pavement. The Brick Building on the Left is the Coast and Geodetic Survey Office, and on the Upper Corner is the Famous Ben Butler Mansion, for Which the Government Paid $75,000.

When the rubber was laid down in 1881 it was 2 inches in thickness. In May, 1902, after twenty-one years' wear, the portion on the incoming road into the station was taken up and carefully examined, when it was found to have worn down to about five-eighths of an inch in the thinnest place, namely, at the incoming end, where horses first step on it from the macadamized road. Other parts of the rubber were worn down to 1 inch and 1¼ inches, these places in each case being near the center of the roadway. Renewal was therefore considered necessary.

In recent years the price of India rubber has largely increased, and its quality varies. Tenders were invited in August, 1902, from four firms, and the prices received varied from £5 11s. 4d. ($27.09) to £17 10s. 3d. ($86.22) per square yard, Messrs. Macintosh & Co.'s price being £10 2s. 6d. ($49.26). The lowest price was accepted, namely, the tender from the India Rubber, Gutta-Percha and Telegraph Works Company, of £5 11s. 4d. ($27.09) per square yard. The material to be used is not, however, supposed to be pure India rubber, but appears suitable for the purpose, and is vulcanized. Rubber of a similar quality was laid in the year 1895 in Wellington Court 42, Albert Gate, Knightsbridge, London, and it was ascertained that "it had worn most excellently and given every satisfaction" at that place.

The total cost of the renewal in 1902 of the paving on the incoming road was £5 18s. 2d. ($28.75) per square yard, including laying, after credit had been given for the old rubber taken up. Since the paving was laid down in 1881 the average cost of general maintenance and examination had been slightly under 3¼d. (6½ cents) per square yard per annum.

At the recent addition to the Savoy Hotel, London, the courtyard was paved with rubber. The contractors, Messrs. James Stewart & Co., courteously supplied the following particulars concerning this pavement:

"The amount of rubber used in the Savoy courtyard is 2,195 feet, 2 inches thick, and the weight of the rubber is 15¼ pounds a square foot. It is laid on a concrete foundation, finished with cement floating to make it smooth.

"The cost of this material laid is 18s. 8d. ($4.54) per square foot, and it may be added that the cost for the same quality of material varies in direct proportion to the thickness.

"We have had no actual experience with this rubber paving for any length of time, but we investigated it pretty thoroughly at the time it was decided to lay it here, and found that the small piece at the entrance to the station at Euston was laid some twenty years ago. The traffic there has been very heavy.

"We think there is no doubt that the results of rubber paving will be entirely satisfactory, but the cost will undoubtedly make the adoption of it for general use prohibitive."

The court measures 75 feet by 50, and the cost of paving was £2,000 ($9,733).—H. Clay Evans, Consul-General.

The man who has learned how little he knows, has struck bed-rock on which to erect the structure of real education.—*Ex.*

Written for The Clay-Worker.

NEW YORK'S BRICK DOCKS.

How the Major Part of the Brick Used in Building the Metropolis are Delivered There.

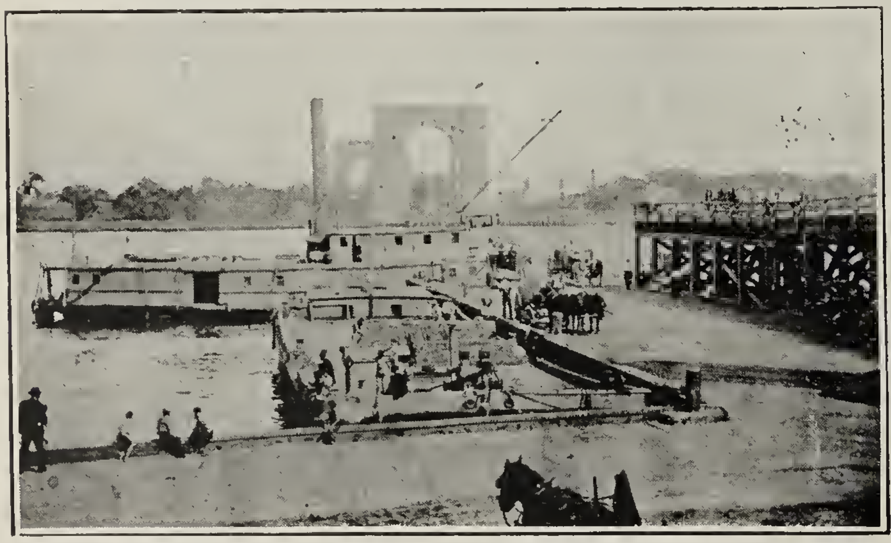
UNLOADING BRICK at the New York docks is not the least interesting feature of the brick's life. From the claybank to the completed building the brick has a series of adventures, which, should the same occurrences, or, relatively the same, be noted in the life of an individual, they would be considered fit subjects for description.

But leaving out of consideration the loading and transportations of the movement toward the city, it will be enough to confine the discussion to the unloading at the docks for the present. Later the other features will be described and illustrated.

There are several places where brick are received. They may be called the brick piers of New York. At piers Nos. 6 and 7, East river, one or more barges and canal boats can usually be found in various stages of unloading. Recently there have not been as many as usual, partly because the season of heavy transportation has passed and partly because more have been coming in by train, quick transportation being essential on some work.

These two piers are canal-boat piers, and a mass of canal boats with all sorts of cargoes usually surround the brick barges. Sometimes as many as half a dozen brick barges are lying there at once. Sometimes only one. The illustration accompanying this shows how they are unloaded. There are no patent cranes or lifts, but men hand them from the barge direct to the wagon as shown. They unload a barge in a surprisingly short time. A constant stream of wagons are waiting to take the brick away to the various jobs where they are being used.

Formerly Pier 34, East river, and Pier 38, East river, were famous brick docks, but in the march of improvements up-town the brick business has had to give way to more profitable traffic. One of the piers is a railroad pier, and the other is utilized by a steamship line. Occasionally a barge may be seen anchored there, but they are few and are only utilized for such work as may be in progress in that vicinity.



Unloading Brick at Foot of Sixty-Sixth Street. Blackwell's Island Bridge in Distance.

The next important pier is at the foot of East Sixty-Sixth street, on the East river, just above where the new Blackwell's Island bridge crosses to Brooklyn. Not more than one barge can be found there at a time, excepting upon rare occasions. Sometimes two are there, but usually one is in a state of partial unloading when the second arrives. It is a more picturesque place than the piers farther down. The brick are all being used on work near. As building gradually moves up-town the piers where brick are landed move with it, so that now it has reached East Sixty-sixth street.

The Harlem river at One-Hundred and Fortieth street has some barges in occasionally for the work going on near there, but the day the piers were visited none were there.

At Pier 42, North river, foot of Morton street, there used to be immense quantities of brick received, but there are no longer any barges there. The pier has been taken by the city for improvement and is being put in shape for use by a steamship line. Building in that vicinity is not going ahead very rapidly now. Possibly when it starts up again there will be other piers established temporarily.

At One-Hundred and Twenty-fifth street, on the Hudson river, there are always more or less barges in. Building development is very rapid in that vicinity now, and huge barge loads of brick are quickly absorbed in supplying the requirements for all sorts of building purposes.

The same methods prevail everywhere. Men's labor is cheaper than it is to establish lifting machinery which will do away with much of the hard work and which will make handling more expeditious. Possibly the fact that it is necessary to unload near the operations where the brick are being used is one reason why nothing of the sort is attempted. It would seem, however, and it has been suggested by brick men, that some means more rapid than those now employed be adopted for handling the brick at the unloading places. Whether it will ever be done or not remains to be seen later. Burt.

THE COST OF LIVING.

In the eighteenth annual report of the Bureau of Labor is given the result of an extensive inquiry into the cost of living in the United States since 1890. The inquiry into retail prices is the first extended investigation covering a long period which has ever been made in this country. To conduct this branch of the inquiry the books of 814 retail merchants were consulted in the various localities. Prices were taken for each month through the thirteen years from 1890 to 1903, covering thirty articles and several grades of each. The inquiry covers the cost of living of 2,567 families, of whom 1,415 lived in the North Atlantic States, 721 in the North Central States, 219 in the South Atlantic States, 122 in the South Central States and 99 in the Western States. The families consisted of an average of 5.31 persons and the average income for the year 1901 was $827, the average annual expenditure for all purposes was $768, of which $326, or 42 per cent., went for food. The quality of fresh beef, for which $50 was expended, was 249 pounds, making the cost per pound 14 cents. Fresh pork cost $14; poultry, $8; salt pork, $13; fish, $9; eggs, $16; milk, $21; butter, $28; cheese, $2.62; coffee, $10.74; sugar, $15.75; tea, $5.30; flour and meal, $16.76; bread, $12; potatoes, $12.93; fruit, $4.12; lard, $9.35; miscellaneous vegetables, $16, and other food not enumerated, $20. The lowest average price of food from 1890 to 1903 was in 1896, when it was 95.5 per cent. of the average price from 1890 to 1899. The highest price

Where Brick Barges Are Unloaded at Pier 7, East River.

was in 1902, when it was 110.9 per cent. of the average price for the period.

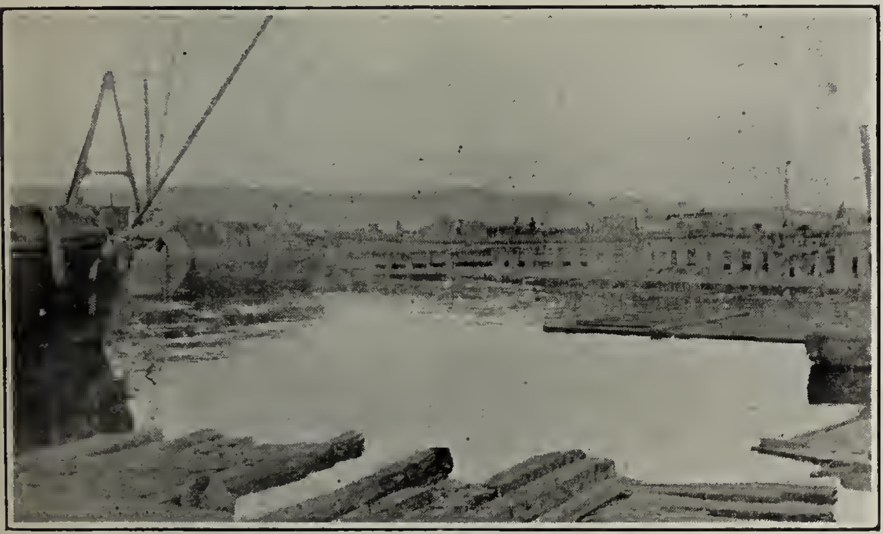
The main conclusion of the inquiry, as stated in the report, is that the average cost of food for a family of five persons is now 15 per cent. above the average, the year of lowest cost having been 1896. The hourly wages in 1903 were 15 per cent. higher than for the period 1890 to 1900. There has been a reduction in the hours of work, while the aggregate amount earned yearly has not increased.—*Exchange.*

Written for THE CLAY-WORKER.

FIREHOLES.

Small Ones and Many, or Large Ones and Few. Which?

IT DEPENDS ON THE quality of the clay. I have talked this over with many burners of long experience, and not one has answered this very important question to my satisfaction. One says: "Give me small and more fireholes;" another one says, "Give me less fireholes and large ones," and so on. I have not heard one say, "It depends on the quality of the clay." The nature and refractory quality of the clay has a great deal to do in deciding how many fireholes should be built in a kiln of a certain size and how large they should be. Clay is either easily fusible at a low heat, as low as 1,800 degrees Fahrenheit, or refractory up to 3,000 degrees Fahrenheit. Now, will not the most ignorant mud-worker plainly see that it depends altogether on the quality of the clay as to how many and how large fireholes are required to burn that clay successfully? For a weak clay not more fireholes than necessary to create the heat required for safe burning, and for a strong clay, more and larger fireholes, to produce the intense heat required to burn such clay to a salable article. And still every burner I have consulted about this matter has made no reference or remark about the fire-resisting quality of a clay. But one advocates few and large and the other more and small fireholes, in neither case giving the reasons why they advocate one way or the other. I say without fear of successful contradiction, that the practical fire test of a clay must determine the number and size of fireholes on a kiln, be it a down-draft or up-draft kiln.



One-Hundred and Twenty-Fifth Street and Hudson River, with Line of Brick Barges at Docks.

Now, for a refractory clay in a down-draft kiln, you want many fireholes, and in an up-draft kiln, where brick are set in benches, arched over, you need less fireholes with the same kind of clay. But is this not a contradiction? One kiln with more fireholes and the other one with less fireholes to burn the same quality of clay. It really appears like a contradiction, but it is not, and I will briefly explain matters and solve the puzzle to the satisfaction of the most doubting Thomas. I will explain it in plain words, just as though I was talking to you personally. In a down-draft kiln, and when you have to burn a refractory clay, the more fireholes you have the quicker you can get the heat to burn that clay to a finish, but in an up-draft kiln of the same size as the down-draft, you will have less fireholes. Why? Because when you set five brick in a bench you will, as a matter of course, have less fireholes than when you set only three or four brick in a bench, and in having five brick in a bench you can safely keep on firing until all the brick in the benches are burned, without melting the overhangers in the arches, and you will have more good salable brick than when setting two-brick benches. Of course, when I say refractory clay in this instance, I do not mean clay refractory enough to make fire brick, but I mean a clay that will stand about 2,200 degrees Fahrenheit, instead of only about 1800 or 1,900 degrees.

If fire brick are burned in an up-draft kiln, you need more fireholes, and consequently three-brick benches will be the right thing. A clay or shale that vitrifies at 1,900 to 2,000 degrees Fahrenheit and burned in a down-draft kiln, say, thirty feet in diameter, cannot be burned successfully and safe with nine fireholes two feet wide. I speak of fireholes with slanting gratebars. These holes have to be kept filled up, to keep out an excess of air, and being so many and so large, it takes too much coal to fill them up every fire. The result is, the top gets too hot before the bottom gets hard enough to finish. If the holes were arranged with doors, then you could fill light, as the clay requires. But the safest way is to build not more than six fireholes for such a clay on a thirty-foot kiln, and different results will be obtained, results that will pay well.

On the Way from Pier to Building. New York Sky-Scrapers in Background.

I really don't see why men with common sense put in a great number of fireholes more than necessary to produce the heat to burn their clay safe, and when they find out that too much heat is the cause of their loss in the kilns, and the burner says that there are too many fireholes, the Mr. Shop-foreman tells the proprietor that he would not make any change on the kilns. What does he know about the burning, when he knows only the details of the manufacturing parts to some extent, or, rather, he thinks he knows? Why in the name of common sense don't they stop up a few holes, and fire only about six out of nine for a clay that they know overheats quickly on top. Let the burner be the doctor, and if he does make a change, watch the results, and then go ahead and do it that way on every kiln, if the results are what you want. Let the burner boss, and if he cannot give you satisfaction, get some one else, but by all means do not let the shop foreman or superintendent or manager pull the string east or west when the burner wants to pull it north or south.

Some sensible superintendents go hand in hand with the burner. If anything needs improvement they both talk the matter over in a sensible, cool way, reach a conclusion, and they try to improve, and generally succeed. But I despise a man who wears a size 7 hat and his head swells so much that no ordinary hatter can fit him with a hat of the size required to encircle the expansion of his brain-box. A swelled head is a real bad disease, but it is easy to cure. The remedy is a strong will-power to contract the expansion, and the head will soon be of normal size.

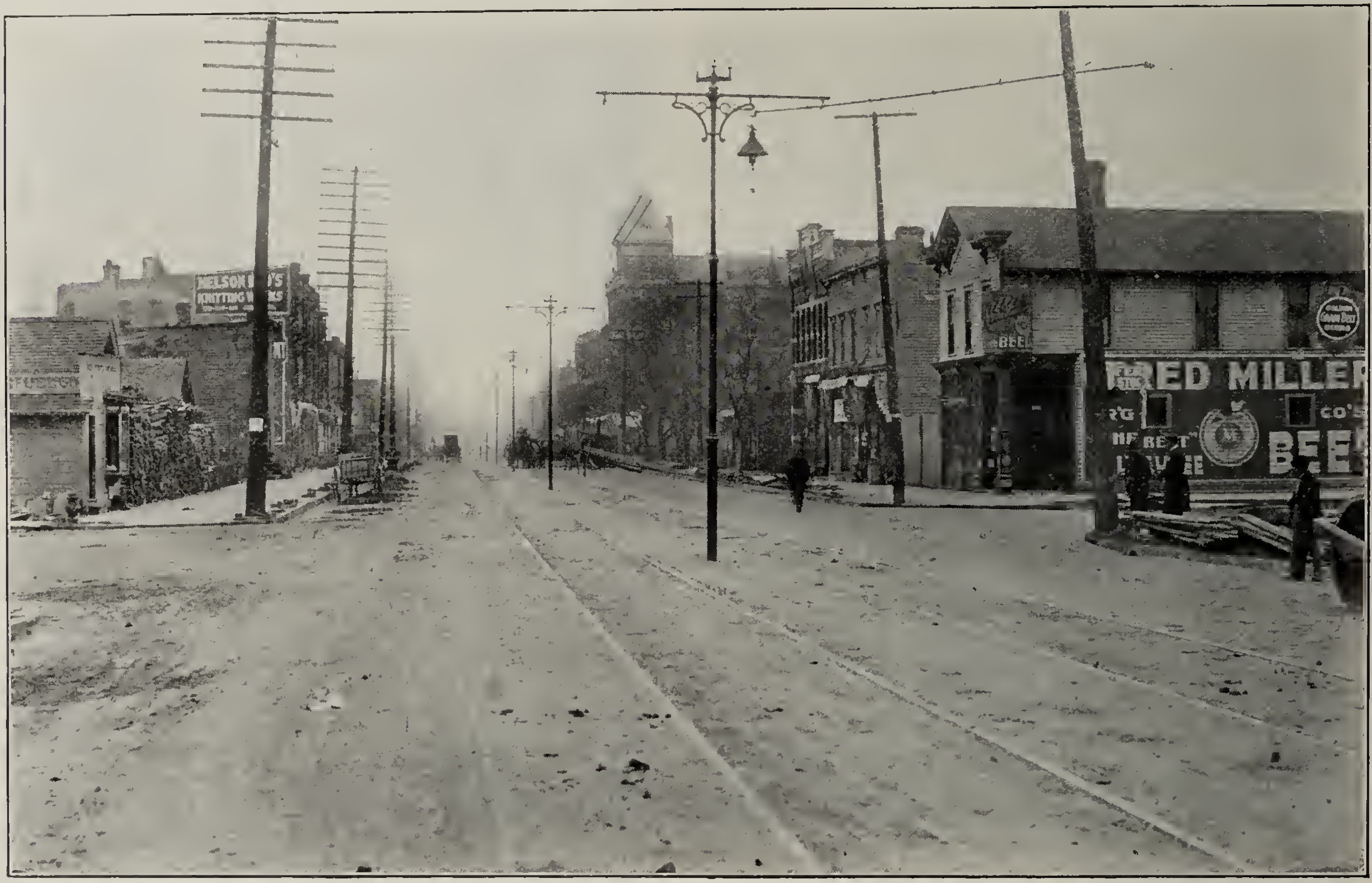
PLAIN TALK.

MINNEAPOLIS—THE STORY OF HER STREETS.

The Charm of a Beautiful City—Brick Pavements the Best Permanent Improvement and Far Superior to Wood-Block and Asphalt.

By RICHARD A. HARTE.

IF YOU ASK A Minneapolitan to designate the chief attraction of his city, in nine cases in ten he will say, the streets. These streets are level and long and straight and wide. The city is a vast checkerboard of rectangular blocks, in direct contrast with its picturesque twin ten miles down the river. Like those of St. Paul, the streets of Minneapolis are well shaded and well drained. Moreover, a large per cent of them are well paved. The paving history of Minneapolis opens with the year 1887. The city at that time had a population of over fifty thousand. Why, you ask, was the matter of paving so long delayed? It was not owing to any lack of public spirit, nor was it owing to a false idea of public economy, but was due wholly to the admirable condition of the natural streets. Minneapolis as a village was most fortunate in having for a foundation a bed of limestone overlaid with a deposit of sandy loam and gravel. The site of the city, while generally level, is sufficiently rolling to afford easy drainage to the river, both above and below St. Anthony Falls. The early street-making, therefore, consisted simply in grading the streets and cleaning the gutters—the soil itself afforded an excellent roadbed for ordinary traffic. It was from a desire to take on metropolitan airs, as much as from necessity, that the Flour City concluded in the year 1887 to pave its streets.



Cedar Avenue, Minneapolis, Paved With Purington Brick, Which Show Little or No Wear.

SIXTY MILES OF CEDAR BLOCKS.

The city was in the midst of the great boom of the latter '80's when the paving fever asserted itself. And, as Minneapolis never does anything by halves, it was determined to pave sixty miles of streets. It was also determined to pave those streets with wood blocks—pine and cedar. This choice was quite natural under the circumstances. The Mississippi river penetrates the vast pine and cedar regions of Northern Minnesota, from which could be obtained a supply of pine and cedar block as well as plank for foundation at a cost much less than that of any other known pavement. In fact, the entire outlay for the 1,200,000 yards of block pavement did not exceed $1,150,000—an average of a little less than $1.00 per square yard.

Various kinds of blocks were used, but the cedar predominated. These were laid on a two-inch plank bed, beneath which was a well-rolled sand foundation. That was sixteen years ago. More than one-half of that original pavement—620,580 yards—has been supplanted by stone, brick and asphalt. A few miles have been relaid with cedar block, a few more with a creosote pavement, the remainder has gone the way of all wood pavements. For the last six years it has been in a more or less complete state of decay.

The experience of Minneapolis with wood pavements was had under the most favorable conditions, and the fact that the streets were never relaid with wood blocks, however cheap, is sufficient comment on that kind of pavement. *It does not pay.*

ASPHALT A FAILURE.

After the experiment with cedar blocks, the city tried asphalt on nearly thirteen miles of the most important business and residence streets. This experiment has also proved a failure—almost a total failure. The failure is so complete that there is no more asphalt being laid anywhere in the city—except to patch holes and repair worn-out sections.

It may be owing to the sudden change of temperature, or what not, but the fact remains that this pavement, although put down on the best of concrete foundations, is in constant need of repairs. On the streets where heavy traffic prevails, the asphalt coating "pushes" before the wheels in hot weather, and after being exposed to the weather for a year or two loses its vitality, so that it cracks and crumbles.

Most of this pavement was laid under a guaranty of ten years, the city retaining 15 per cent. of the contract price as a support of the guaranty. Already, after the lapse of six years, in some cases this guaranty fund has been exhausted in repairs and the city has had to go down into its own pocket to keep the streets in decent order.

There being no asphalt mixing plant in the city, the material for repairs must be obtained at the Barber Asphalt Works, at St. Paul. This is at once an inconvenience, an expense and a humiliation. There will be no more asphalt pavement laid in Minneapolis, unless there is a radical change in conditions.

GROWTH OF THE PAVING-BRICK IDEA.

Minneapolis is not a brick city, and yet it has now nearly fourteen miles of brick pavement. Brick has taken the place of the cedar block on streets of moderately heavy traffic, on alleys and gutters.

"Brick pavement is far superior to asphalt, so far as our experience goes, and I have been city engineer for sixteen years with a brief interval," said Mr. Rinker, in answer to my question. "What are the strong points of brick pavement?" "Well, I should say, durability, cleanliness and the fact that it requires little or no repairs. We spend practically nothing for repairs on brick pavements. We have nearly fourteen miles of brick pavement, but none of it has been down long enough to test its actual life. I should think it would last twenty years if the traffic is not too heavy. I have one fault to find with the ordinary brick pavement. The bricks chip off at the edges, leaving a corrugated, uneven surface, which renders the pavement noisy." "Is not this fault remedied by using the modern brick paving block, which reduces the number of corners to be chipped?" "Yes, I think that will help to a great extent. A pavement which affords a good footing and at the same time presents a reasonably smooth surface is what we all are after. In this respect, brick and sandstone, the sandstones we are using here, come as near being perfect as it is possible to get a material."

"Which is the most durable, brick or sandstone?" I asked Mr. Rinker.

"That I cannot tell. It depends much upon the foundation and the quality of the brick. It depends, too, much upon the kind of traffic. Our sandstone pavements which have been under heavy traffic for six or seven years show somewhat the worse for wear. The sandstone wears rapidly, but furnishes an excellent footing for heavy traffic, especially on steep grades. But brick—the brick that we are getting now—makes a very satisfactory pavement, and then it is not as expensive as some others."

It seems that sandstone is popular here, as well as in St. Paul, for streets bearing heavy traffic and for grade work. It is displacing granite, being cheaper and affording a more satisfactory roadbed. Brick, however, is being more and more used as its qualities are better understood. It is the only all-round pavement within reach of the ordinary property owner who has to pay the bills.

THE STREET-CAR COMPANY AND GRANITE.

The Twin City Rapid Transit Company is laying granite blocks in the space between the rails wherever new pavements are being put down, along its lines both in Minneapolis and St. Paul. It does not matter with what material the remainder of the streets is paved, whether brick, asphalt or sandstone, granite blocks go between the rails. The reason given out is that granite is more durable. This is true. Granite is without doubt the most durable as well as the most expensive of pavements. But there is a more cogent reason, and one that is not given to the public by the astute management. This reason throws a bright side light on the paving question. It is plain to any observer that drivers of teams, whether for pleasure or for profit, avoid granite-paved streets whenever possible. To pave the space between the rails of a street-car track with granite blocks is to keep that part of the street clear of the wheeled public. With the space between the rails paved with granite and the remainder of the street paved with brick, the street car is seldom disturbed in its right of way—they can take off the gong.

The city of Minneapolis has in round numbers ninety miles of pavement. Of this forty three miles are of cedar block in the last stages of decay. Of brick there are fourteen miles; of asphalt thirteen miles; of sandstone twelve miles; of granite eleven miles; of creosoted blocks about three miles. It will be seen

Summit Avenue, Minneapolis, a Fine Brick Pavement on a Fine Residence Street.

from the above table that since the day of cedar blocks, the brick pavement has taken and held the lead.

THE CREOSOTED BLOCK.

There is a disposition in Minneapolis to experiment with a creosoted block. This was brought about by a company agreeing to put in a $40,000 plant, on conditions that the city would give them an initial order for 40,000 yards of their creosoted product. The offer was accepted by the city, the plant has been installed and a part of the contract amount laid. This particular creosoted block costs the city $1.70 at the factory, or about $2.50 laid. What the creosoted block will amount to as a pavement has yet to be demonstrated. But at the price demanded, it is difficult to see why a city should care to experiment with an unknown quantity in the face of tried and proved pavements like sandstone and brick.

COST OF MINNEAPOLIS PAVEMENTS.

The average cost of asphalt pavement has been $2.55 per yard; granite on sand base, $2.45; sandstone on sand base, $2.15; brick on concrete base, $1.80. With this showing it would seem that brick should continue to occupy first place in the paving procession.

As in St. Paul, the most of the paving brick comes from Galesburg, Ill., and bears the Purington stamp. Some Iowa brick is used and some bearing the Des Moines stamp. Lately the paving block is taking the place of the regular sized brick. It obviates the one objection to brick pavement.

Written for The Clay-Worker.

THE OUTLOOK—No. 5.

WE WISH NEXT to speak of the labor question and the prospects of peace among employers and employed. We have dealt with laborers — wage-earners — for years, and have wrestled with strikes and strikers until we are ready to pray as did David of old, "Lord, deliver us from the hands of evil men." We have been forced to hunt for men on Sundays and weekdays alike, in order that the plant might be kept in operation. We have had to turn down good orders at prices that promised great gain to us, just because men would not work without more pay. We have dealt with this conglomeration of affairs for months at a time, spent money, time and strength, trying to get a good solution of these vexatious questions, but we are not disposed to boast of our success in meeting the difficulties. We met the difficulties, to be sure, but there are hollow places in our purse that should have a bloated appearance but for these sad meetings.

There is nothing on earth that is so much inclined to prove the quality of one's nerves as to meet a committee of one's men on Monday morning who present demands beyond one's power to grant, or if not beyond his power at least beyond his intentions, and accompanying these demands a statement that all the men, from the hack-boy to engineer, refuse to turn a wheel until these demands are granted. How rapidly ideas shoot through the manager's brain. He thinks of more things in one minute than he has been accustomed to think of in two hours.

There is the order-book with the names of customer after customer followed by long figures, many of them marked urgent; and then the empty stock shed. Strange, is it not, that the strike should occur when the stock of bricks is well-nigh exhausted? Then there is the ideal weather for the brickmaker, when work can be accomplished to such good advantage. Strange again that strike should always occur in good weather. And again he thinks of the contracts he has on hands that have a time limit, and of other contracts soon to be let to the lowest bidder. And then he thinks of the last calculation he had made of the cost of production, and the small margin of profit at the present prices and under the present schedule of wages, and then he is ready to think of the decision he must make in a few hours.

He carefully feels of the visiting committee and finds them as firm as his own hard-burned bricks. The stubborn men always get on these committees. He tries to reason them out of the stand they have taken, even going to the pains of showing them the small margin of profits now obtained and the consequent impossibility of granting their request. But he soon gives this up and tells them to meet him at his office to-morrow morning at 8 o'clock. And then comes some more thinking, but it is now of the cool, calculating order. How many men can he depend upon not to join the strike?—for there are always some that oppose such a move and only join because they are forced to do so by their fellow-workmen. How many new men can be secured on short notice to take the places of those strikers, who will stick to their determination to carry the strike out to the end? To be sure, just for present purposes, it would pay to make terms with the old men. But when men once get the proprietor on the go toward higher prices, there is no telling where they will let up. Three months ago they were glad to go to work at the old schedule, but now they declare that to be mere starvation wages, and demand an increase of 20 per cent. If that be granted, it will not be three months until they will look with equal contempt upon the new schedule, and demand another raise of wages. And so the decision is reached: "No increase in wages, even if the factory has to remain closed during the rest of the season." So to-morrow morning the committee receive their answer and the works are closed until men can be secured to operate it. Some of the old men return to their places amid the jeers and threats of their more determined companions, and with these as a nucleus, the manager begins to marshal his forces. At last, after expending sufficient physical and mental energy to have run a brick factory through two years' ordinary work, enough men are obtained to start the wheels to going, and the boss is again happy. Not supremely happy, for there are too many blunderers to look after among the green hands and too many mistakes to be rectified. But still he is happy over his well-bought, well-earned victory. The old men who failed to return to work raised a few disturbances among the so-called scabs, but finding the law too firm of hand, at last gave up the fight, and a few more returned to work, but many sought work elsewhere, and peace and calm once more spread their wings over the smoking kilns. But it was a long pull to get matters up to such a grade of order and efficiency as obtained prior to the loss of the old men.

What a pleasant sound that phrase, "the old men," has to the manufacturer. Viewed from the simple standpoint of good workmanship, the old men are worthy of much consideration. But when one has employed some men for years, there grows up between them a bond that is not of a monetary consideration. Father and son have alike found employment under the same roof, and it leaves a void in the employer's heart when he kindly but firmly tells them he cannot accede to their demands, but hopes they may find employment elsewhere at wages that suit them. Although their actions are causing him great vexation and loss, still he cannot find it in his heart to censure the peaceable ones, for they are acting the part of free men, and have the right to go their own ways in the pursuit of a livelihood. So he tells them good-bye, and even intimates that should they ever desire it, he would try to make places for them when they got tired of roaming and came back to the old brick shed. And within a twelvemonth nine out of ten were back, and employer and employe alike seemed to have forgotten the late unpleasantness as the wheels again moved smoothly and the furnaces roared a welcome to the old engineer and burners.

But all have suffered a loss that can never be regained. Women and little children have gone hungry and scantily clad against a vigorous winter; and death has come and claimed more than one whom he found a ready victim of want and exposure.

Such is the strike method for the settlement of labor troubles. Is there no better way? Where lies the blame? Is it possible to reach a solution of these vexed questions having none of the fatal consequences of the strike? But as we are on the subject of "The Outlook," and not on strikes and their preventions, we will take a short view of the situation as it now appears to us, and leave the further discussion of these interesting topics to some future date. Perhaps by that time these questions will have solved themselves, as many questions of social and political economy have a habit of doing. L. C. MOORE.

Written for THE CLAY-WORKER.

LUBRICATION OF JOURNALS OF MODERN BRICK AND TILE MACHINERY.

THE processes of lubrication of brick and tile machinery have changed considerably in recent years, until at the present time there exists practically a perfect method of oiling the various parts in which friction prevails. Not long ago it used to be the custom for a lad to run from journal to journal of the shafting with an oil can or a pail of grease and squirt oil into the oil hole, outside the oil hole, on the floor and about everywhere, oftentimes neglecting to reach the shaft itself. Or he would carry a grease or fat dauber, and with this piece of flat stick, shaped from a split shingle, he would apply daubs of the hard grease at points where he thought the revolving shafting needed it. Not infrequently the parts requiring lubrication were entirely missed. The consequence of these methods of lubrication were shown in the premature wear of shafts and journal sleeves, in heating and binding bearings, oftentimes to the extent of igniting the waste and adjoining woodwork. But the day of plugged oil holes and careless application of lubricants in brick and tile factories has passed away. The chief reason has been the introduction of modern types of machinery, in which there is greater delicacy of parts, more oil holes, higher speed, and other needs of effective lubrication. Therefore, in visiting various brick and tile manufacturing plants I find that there are some good methods of oiling machinery bearings and general power and transmission equipments in vogue.

THE OIL CAN.

One can hardly imagine the intrinsic value of the simple little every-day oil can until he has been accustomed to use oil cans for quite a while. The oil can which is held improperly cannot be expected to do good work. There are the oil cans with indented nozzles, out of which too little oil is forced and the result is that the parts are not wholly oiled. Then there is the oil can with the nozzle or outlet too large with the result that the parts are flooded with oil and without assisting in the lubrication of the parts. Figure 1 is the common mode of holding the can, which is well enough, if the nozzle can be projected into the oil hole or oil cup of the bearing. But the trouble is that the user sometime tries to reach holes at a short distance, by pressing the base of the can, and "squirting" the oil to the part. The oil jet is bound to spray and wastage results. First make sure that the oil is clear and the channels free from foreign matter. Then place the nozzle of the can to the opening and recollect that a drop of oil is as good as an ocean. This is simple information, but after one does a little looking about in shops and finds bearings deluged with gummed oil, and watches men and boys shoot oil jets everywhere and waste oil and flood parts and floors with oil, he feels like writing things.

Oil costs money. Oil is all right in the journals, but when it is all over the place it is liable to increase the fire risk. In order to get at some of the holes in difficult positions in journals, the curved nozzle as at *a* Figure 2 is used. In Figure 3 is a drawing of one of the systems for oiling overhead shafts used in a certain brick and tile works and I found other instances of the same type. The idea of the stick plan for supporting the can of oil is to save one the trouble of climbing a ladder to oil the journals. The stick is marked *c*, and the can is fixed to place at the end of the stick by the little metal lips *bb*. I watched the man operate the affair. He started in at one end of an apartment and deposited oil jets into the oil holes in the journals of the shaft above. The nozzle of the can had to be full open to let the oil run itself. It seemed to me that the man's thoughts were elsewhere during the lubrication process, for in every case he would deluge the boxes before he would manage to find the oil hole.. Several times he walked from one bearing point to the other without taking the trouble of reversing the stick, with the result that the stream of oil shot out from the oil can nozzle to the floor below. He had the place quite completely lubricated before he had finished.

CAPPED OIL HOLES.

In recent years capped oil holes have been employed quite extensively in brick and tile works, or, in fact, anywhere in which there is a likelihood of excessive dust.

The dust accumulations in bearing are, of course, a source of considerable annoyance, and the addition of the oil simply increases the trouble. Soon the oil holes get packed and plugged, and the choking of the oil flow results in heated parts and worn places, including gouging and grooving, sometimes to such extent that the journal is put out of commission for the time being. Figure 4 illustrates the screw cap which is used to protect oil holes which are subject to dust. The threaded portion is signified *D*. These caps are a bother to the hurried workmen who have the oiling to do, and consequently I found that many were removed and the plug placed at one side or hung at hand with a wire. The type of cap that fits over the hole is better than the threaded kind. The latter may be tighter, but the former is easier to remove and replace.

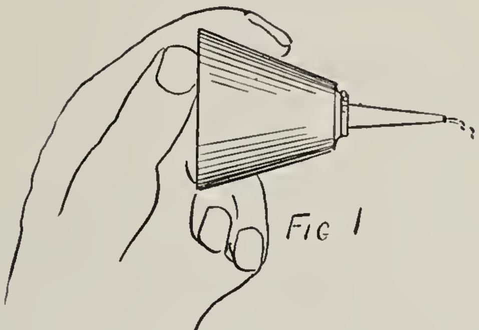


FIG 1

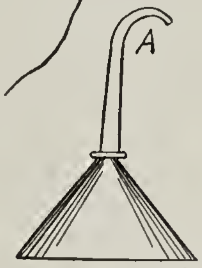


FIG 2

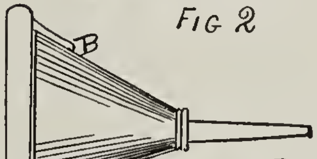


FIG 3

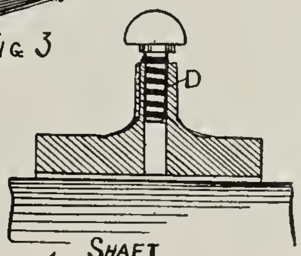


FIG 4

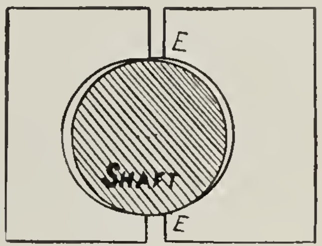


FIG 5

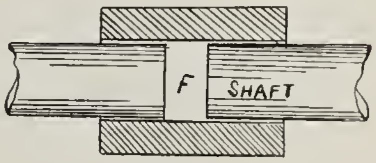


FIG 6

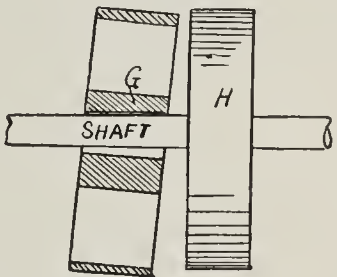


FIG 7

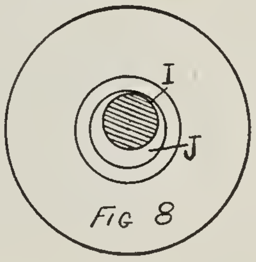


FIG 8

OILING TROUBLESOME BEARINGS.

Figure 5 shows the condition in which we found one bearing to be with which the workmen had trouble. It seems that new brasses had been put in, the old one having become worn. These brasses were a little too small in diameter, resulting in the binding of the edges at *EE*. These edges formed scraping sides and the oil films were scraped off as fast as applied, and the journal remained heated until the brasses were finally removed and turned out so as to fit the shaft. Figure 6 shows a form which I saw in use in a brick and tile works in which two shafts butted, as at *f*, in a coupling. The shafts were held in their original position by collars. The coupling was used simply to support the shaft ends.

In the setting up of the parts, no provision has been made for an oil hole, consequently the portion of the tube at *f* heated and produced considerable trouble. The remedy was effected by boring an oil hole to feed the lubricant into the space of *f*.

TILTED LOOSE PULLEYS CAUSE OF TROUBLE.

Figure 7 is a sketching of a combination of a tight and loose pulley that happened to be giving trouble as your correspondent dropped into a plant. There were two machinists on a ladder working away at the tilted wheel, trying to get it to stand up and run even with the tight pulley *h*. The trouble was due to the wearing down of the hub of the loose wheel, as represented at *g*, as this wheel is shown in section. No amount of bracing with outside collars would stand the wheel up, although the workmen tried it for quite a time. They would fit the loose wheel close to the tight one and then force a collar up against the hub of the loose wheel, hoping to make the wheel brace of this collar and ride even. But the wheel had to come off, and after it was centered on a shaft and babbitt metal run into the bore, and the worn portion thus taken up, it operated all right in its position with the tight one.

SOMETIMES IT IS THE SHAFT THAT IS DISORDERED.

Figure 8 illustrates a disordered condition of the wheel and shaft combination, due to the wearing down of the shaft or the use of a shaft which is too small originally. This is something that happens oftener than one would suppose. I found a number of instances of this nature in brick and tile works. The wheel itself is signified in outline.

The worn or increased size of hub is too large for the shaft *i* as shown, leaving a space in the bearings as at *j*. This space is shown in exaggerated form so as to explain the point better. Because of this order of things, the wheel bobbed and wabbled badly on the shaft, producing heating, grinding, groaning and squeaking sounds. Particles of ground metal were seen on the floor. Oiling liberally was of no avail. The wheel was finally taken down and the interior fitted with a sleeve, and as this sleeve formed the right conjunction with the diameter of the shaft, no further trouble resulted with this combination.

"TRAVELLER."

ARTIFICIAL FUELS.

Everybody who has spent any time on the continent of Europe has noticed the economy practiced by Europeans in the consumption of coal and marveled that the results should be so satisfactory. To be sure, the lofty, tombstone-like porcelain stove of the Germans has a chilly look at first, and the cooler atmosphere of German houses may give one a homesick longing for the furnace-heated rooms of America, but gradually the openminded stranger comes to look with approval on the European arrangements for keeping warm, and to wonder why his own people have not perceived the beauty, the cleanliness, the economy and satisfactory results that some patent fuels have to recommend them. That many a Yankee has turned the matter over in his busy brain is attested by a chapter on artificial fuels in Edward W. Parker's report on "The Production of Coal in 1902," which is about to be published by the United Sates Geological Survey as an extract from the annual volume of Mineral Resources.

Prior to 1902, about 400 patents had been issued in the United States on artificial fuels, but up to the close of 1901 none had proven a commercial success. Mr. Parker gives a list of United States patents granted since January 1, 1902. It remains to be seen whether any of them will be successfully developed. The list includes 37 patents, but contains no mention of fuels made from petroleum or petroleum residue unless used in connection with coal, lignite or peat. Neither does it include any compounds that have for their object the increase of fuel efficiency unless they are used in the manufacture of the fuel itself. Three patents were issued on briquetting machinery.

The steady advance in the price of coal—no less than 40 per cent—which has taken place since 1898 has stimulated experiments looking to the invention of artificial fuels. Results obtained in foreign countries from the use of lignite and peat in briquetted form should encourage producers in the United States to try similar methods of manufacture. Small sizes of anthracite coal formerly wasted are indeed recovered now by washeries from the old culm banks and utilized. A large amount of coal lost in the form of dust or finely pulverized material might also be put into convenient shape for domestic consumption and slack now wasted at many of the bituminous mines in the United States might be used to advantage if compressed into briquettes. There are many indications that the time is not far distant when these neglected fuel resources will all be utilized.

REMOVING STONE FROM CLAY BY THE SLUMMING PROCESS.

FOR THE mechanical analysis of a clay, the determination of the components of clay, sand and broken stone of different sizes, there can be no question that Schoene's apparatus is the nearest to perfection yet known. It appears that in using this apparatus many people find a difficulty in setting it for regulating the speed of the current, if we may judge from the number of inquiries upon this point that we receive. We therefore give the following data, which we find satisfactory in our own practice. In order to determine the slumming speed that corresponds to a certain pressure height in the piezometer it is, in the first place, necessary to know exactly the sectional area of the cylindrical slumming chamber. To do this we paste two strips of paper, exactly horizontal and at carefully measured distances from the rim. The distance selected is generally 10 cm. in the upper cylindrical portion of the slumming chamber. This is then filled with water so far that the lower meniscus of the liquid is level with the top edge of the upper strip of paper. We now close the faucet, and then, with a pipette, take water out until what remains is level with the top edge of the lower strip of paper. The water taken out with the pipette is measured in a graduate (measuring glass). If it is wished to make this measurement before the whole apparatus is set up, we can fill the slumming vessel quite full with water, then close the small tube by a cork, so that no air bubbles form, then with a pipette take the superfluous water out by the large tube. We found in our own apparatus, at a height of 10 cm., 217.5 cub. cm., from which it follows that we have a cross-section of 21.5 sq. cm. The further calculation is based upon the theoretical flow, according to which, for the same orifice, the quantity of the flow will be in proportion to the square root of the pressure height. If we indicate the pressure heights in two tests as h1 and h2 and the corresponding quantities of flow as m1 and m2, then we have,

$$\sqrt{h_1} : \sqrt{h^2} = m_1 : m_2, \text{ or } h_1 : h_2 = m_1{}^2 : m_2{}^2.$$

For the case in point this law is not quite accurate and a correction is needed, because the height of the column of liquid in the piezometer is affected, on the one hand by the attraction in the narrow tube, on the other hand by the friction offered to the water, which the small orifice for the overflow somewhat increases. The amount of this increase is equal for all pressure heights in the same instrument, but differs in different apparatus, and it is in the first place necessary to find the amount by tests. In order to find the pressure heights corresponding to the theoretical law of flow or current we must deduct the quantity k from the observed pressure height. The above equation then becomes changed to $h_1 - k : h_2 - k = m_1{}^2 : m_2{}^2$. For the determination of k two tests are sufficient. We allow exactly one liter of water to flow, first at the smallest possible pressure, then at the greatest possible pressure, and note exactly how many seconds are required in each case. In the apparatus which we constantly use we found that at 53.5 mm. pressure the time was 855 seconds, and with a pressure of 689 mm. the outflow of exactly one liter of water occupied 220 seconds. Therefore the flow in the first case was in one second 1.17 cub. cm., in the second case .4.54 cub. cm. From this we get the equation:

$$53{,}5 - k : 689 - k = 1{,}17^2 : 4{,}54^2$$
$$1{,}17_2 \cdot 689 - 1{,}17^2\,k = 4{,}54^2 \cdot 53{,}5 - 4{,}54^2\,k$$
$$943{,}2 - 1{,}369\,k = 1102{,}7 - 20{,}612\,k$$
$$19{,}243\,k = 159{,}5$$
$$k = 8{,}29 \text{ mm.}$$

We are now in a position to calculate for any desired speed of flow and set the piezometer accordingly. Suppose, for instance, that speed should be 2 mm. per second, then in our apparatus—the cross-section of the slumming chamber being 21.75 sq. cm.—c.c2 : 21.75+0.435 cub. cm. flowing out in the second. If we set down these figures, as also the figures in the first test in the original equation, and denote the sought-for pressure height by x, we will get the following equation:

$$53{,}5 - 8{,}3 : x - 8{,}3 = 1{,}17_2 : 0{,}435^2$$
$$45{,}2 : x - 8{,}3 = 1{,}369 : 0{,}1892$$
$$x - 8{,}3 = \frac{45{,}2 \cdot 0{,}1892}{1{,}369} = 6{,}234$$
$$x = 14{,}5 \text{ mm.}$$

In a similar manner we calculate the pressure heights for the speed of flow of 0.5 mm., 1.0 mm. and 2.0 mm. per second and put down the results in tabular form and fasten this little table to the frame of the slumming apparatus, where it is always before our eyes while using it:

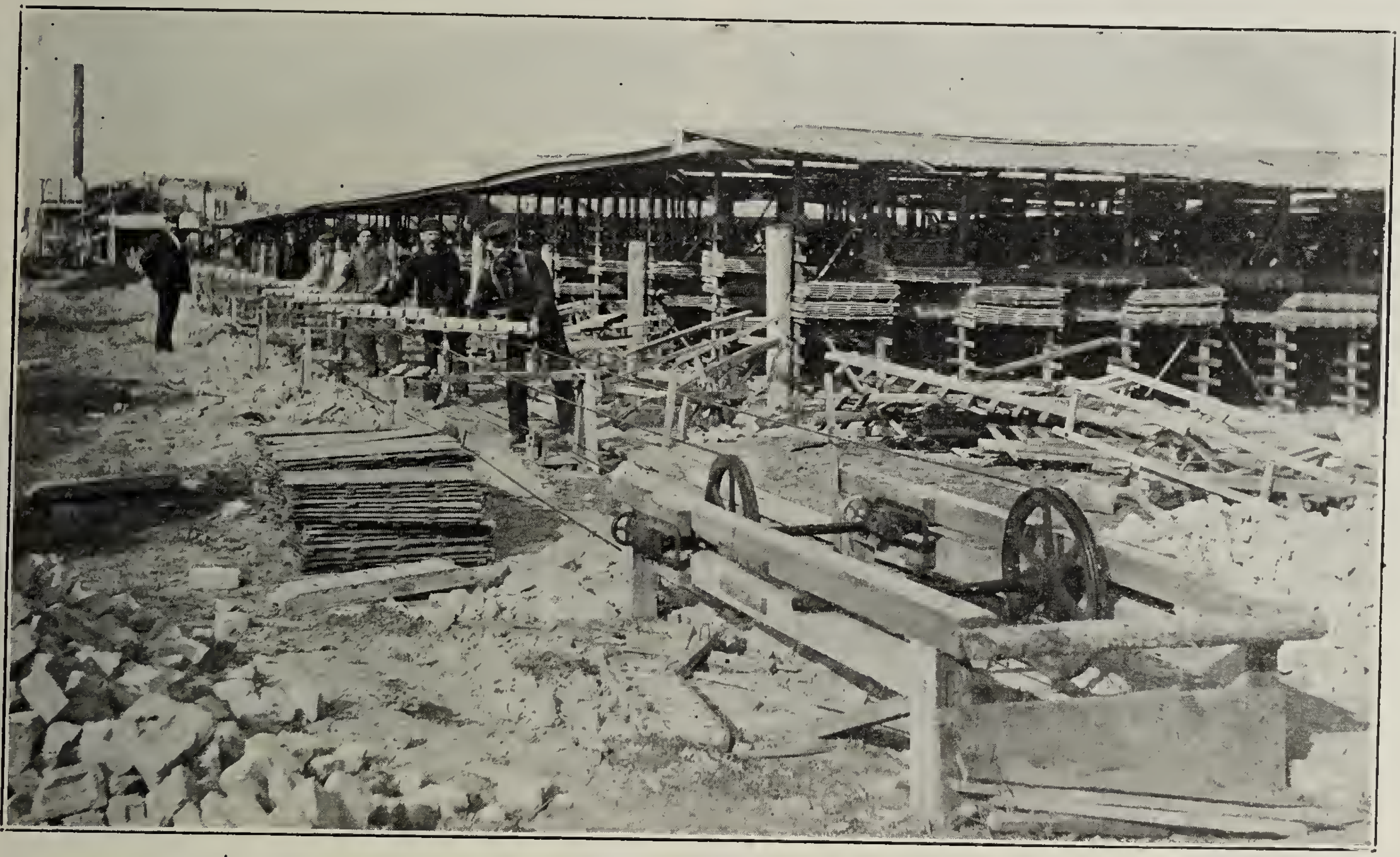
Slumming current speed per second.	*Pressure height.*
0.2 mm.	14.5 mm.
0.5 mm.	47.4 mm.
1.0 mm.	164.5 mm.
2.0 mm.	633.0 mm.

Many prefer to find the required speed of flow by trial instead f by calculation. To do this the cross-section of the slumming ylinder is found, in the way given above. From this we find ow much water must flow out per second. If, for instance, the rea of the cross-section is 21.75 sq. cm., and we wish to work vith a current speed of 0.2 mm., then the quantity that runs out n a second must be 0.435 cub. cm. We set the apparatus at a eight that we think will give us the right velocity and note the ime required for the outflow of one liter, or, for low velocities, co cub. cm. and find from this the flow in one second. If this s too high or too low, we set the pressure lower or higher, as the case requires, until we get it right. The figures given above will be found useful as a starting point. When, in using a very low velocity, the current is not continuous, but only comes in drops, the column of water in the piezometer is not at a constant height, but falls and rises with each drop. We then take for our mark the lowest point to which the column falls when a drop comes away.—*Thonind. Z.*

BRICKMAKING IN NORTH DAKOTA AND MANITOBA.

Improved Methods of Manufacture in the Land of Ozone.

THE DAILY life of the average citizen on our Northern border line is characterized these days by a degree of strenuosity that is seldom equalled in any other part of the United States. The clayworkers of this section are enjoying their full share of prosperity, and right now are kept going day and night almost by the demand for brick and other building materials. The season for manufacture of brick in Dakota and Manitoba is much shorter than in the central and southern states, so it is necessary to keep the plants going to their full capacity during the summer season. Since the yards began operation in May, there have been no idle moments for anyone connected with the brick business.



The Alsip Wire Rope Brick Carrier at the No. 2, Winnipeg Yard.

One of the busiest men in this section is Mr. W. P. Alsip, of Winnipeg. It is his privilege to be making brick in two countries at the same time, for he owns and operates plants in Winnipeg and at Grand Forks, N. Dak. Mr. Alsip is a born and bred brickmaker, and his years of experience has made him master of every detail of the business. He is possessed of much inventive talent and has introduced a number of improved appliances that has reduced the manual labor and at the same time improved the quality and increased the daily output of his brick plants.

One improvement of which Mr. Alsip is especially proud, is a method of conveying the green brick from the machine to dryer by a wire rope delivery system. This, as our illustrations indicate, is a simple, easy and effective means of handling the green brick, and its economy and efficiency is proven by the fact that it has been adopted by most of the neighboring yards in North and South Dakota.

Mr. Alsip's Winnipeg yards were built in the spring of 1904, and will well repay an inspection, for a number of improvements have been introduced in the drying racks and kilns. Visitors are always welcome at the Alsip yards, but they will find it best for comfort to get there during the summer months. The work of building these yards was started in the middle of May and since then they have averaged two million of brick per month, which are made on Potts Horizontal Stock brick machines. Potts disintegrators are also used.

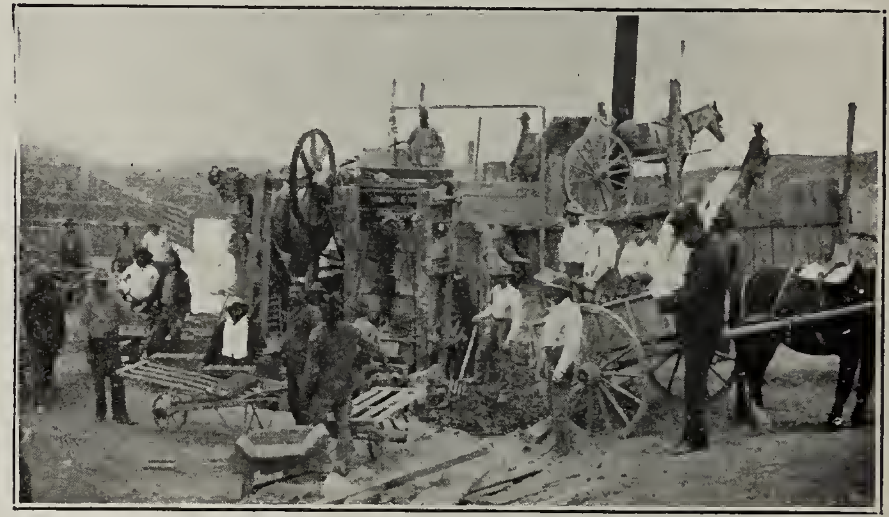
Mr. Alsip has made several million of brick for the Government at Pine Ridge, S. Dak., on the Indian Reservation where much of the work on the yard was done by Indians, as the reader may see by the accompanying illustrations.

The Winnipeg yards are run under the direction of Mr. Alsip's father, Wm. Alsip, Sr., who is a veteran in the business. He made eight million brick last year and fully expects to reach the ten million mark this season. Most of the output is common building brick but a goodly portion are hard burned sewer brick which bring a dollar more per thousand than the others. All the brick are burned with wood in common up-draft kilns, the entire process requiring from eight to ten days.

W. P. Alsip and the Workmen at the Pine Ridge Yard.

A Good Kiln at the Pine Ridge Yard.

Hacking the Green Brick on Open Yard.


Machine and Crew at Pine Ridge.

Setting a Kiln at Winnipeg Yard No. 2.

William Alsip, Sr., at the Winnipeg Yard No. 1.

Mr. Alsip assures us that the demand for brick has been so urgent this summer that not infrequently the brick have been taken out of the kiln so hot that there was danger of setting fire to the wagons and cars. As a consequence prices are stable, and average about $8.00 per thousand.

THE USEFUL PROPERTIES OF CLAYS.*

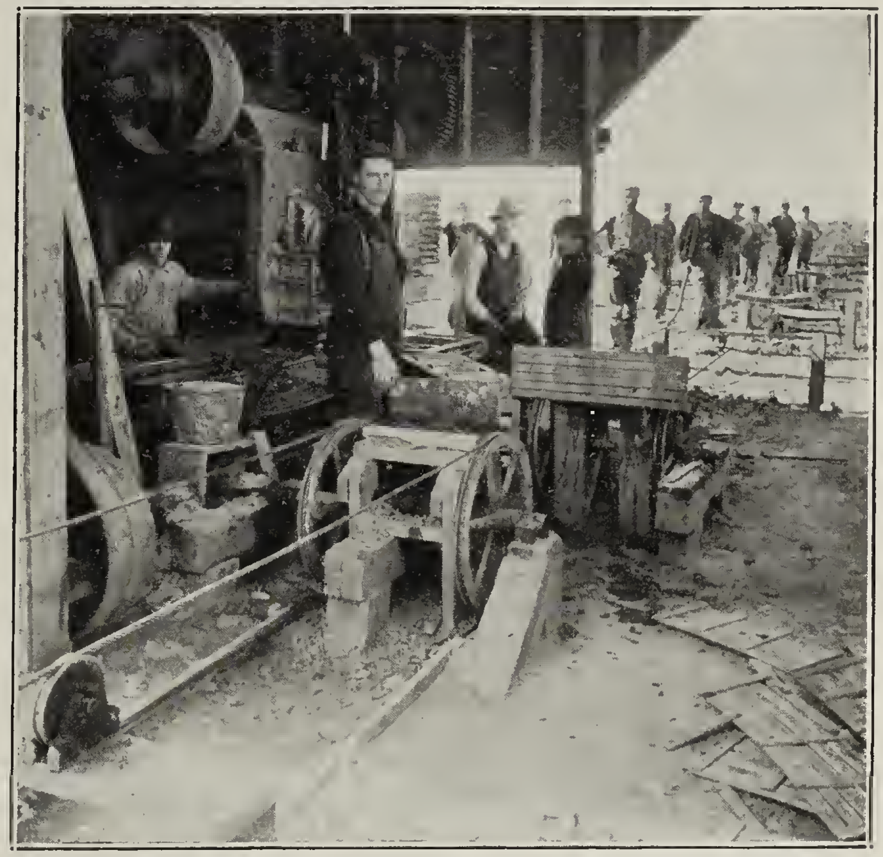
[INTRODUCTION.]

FROM THE EARLIEST dawn of history man has exercised himself in fashioning into products of beauty and utility the plastic materials which he found prepared for his hand on or under the surface of the earth. The stone age was followed by the bronze, and this in time by that of iron, and this in turn by the age of steam and electricity; but throughout all of these changes the plastic arts have flourished in proportion to the height of civilization that the peoples have reached. Science and art, poetry and history combine to lend fascination to a study of clays and clayworking. Records of the manners and customs of old and almost forgotten civilizations, such as the Mycenæan, or the Mexican, are carefully gleaned by the archaeologist from the more or less crude linear markings and figures depicted on fragments of pottery and statuary which have come down to us. From the few rude earthenware chips which remain to tell us of our prehistoric ancestors to the finished and delicate porcelains of Dresden and Sevres, the industry of man records its own development.

Although in the direction of pure utility, as in the manufacture of bricks, tiles, and common earthenware, much has been accomplished, the fact is before us that, in the production of works of art and beauty fashioned from clay, America is not to-day the equal of Europe. The reasons for this are various and need not be discussed here. It is sufficient to point out that they are not of such a nature as to prevent America from ultimately achieving the highest position of all in this domain. The fact that many tons of clay of various sorts are annually brought across the ocean to us for use in our potteries, might seem to indicate that our native clays were of themselves unfit for use. If indeed this were true, it would be an insuperable obstacle to final success, but the fact is that, although it may at present be more profitable to import a clay than to develop a native source, America undoubtedly possesses unusually rich clay and kaolin deposits, some of which are fitted for the production of the most delicate and beautiful objects. It is interesting to note that the pottery which has been a pioneer in works of art made entirely of native clays was founded and fostered by an American woman. It is by just such efforts that wider and further growth will come. In these days of ardent emulation and competition among the nations, it is fair to anticipate the time when an American name shall be added to those which stand for the highest achievement in ceramics, or the art of clayworking. As soon as a greater number of individuals among our people become interested in the properties and possibilities of our native clay bodies, development is sure to follow. Clayworking is neither so difficult nor so expensive but that in some cases objects of art have been molded in the home and burnt in private kilns. On the other hand success is attained only at the price of diligent study and persistent effort. It is with the hope that the dissemination of knowledge concerning the useful properties of clay will lend to a wider popular interest in their study and use, that this article is written.

FORMATION OF CLAYS.

Clay may be defined as an earthy deposit, found on or below the surface, which when finely ground and mixed with water forms a moldable or plastic mass and can be burned to a hard, stonelike substance after drying. The original crust of the earth was of course formed of the rocks which crystallized from a molten magma. These crystalline rocks of igneous origin underwent gradual crumbling and decay caused by the varied actions of the elements. It is probable that only students of rock structure realize how steadily and continually rocks are undergoing secondary changes and decay. "Enduring as the rocks" is an expression of merely relative truth. When rocks crumble the resulting material may be found either heaped up in place in which case they are known as residual deposits, or the fine material may have been picked up in suspension by moving waters, sifted out and deposited at some remote place in beds or layers forming sedimentary deposits. These deposits once formed have been, in some cases, acted on by tremendous forces in the course of the great geologic periods. Folded and buried under great crumplings of the earth's crust they have been to varying degrees subjected to heat and pressure and have thus become metamorphosed. Consolidated into sedimentary rocks and shales they become again subject to decay. Changed and disintegrated, now acted on by percolating waters, in which it is known that many of these crystalline minerals are distinctly soluble, or again subjected to acid or alkaline solutions, as the case may be, it is little wonder that every useful earthy deposit found by man on the surface of the earth is to a certain degree unique in its properties, requiring special study and treatment in order to insure the highest degree of success in its working. Clays of nearly the same chemical composition and of similar physical txture, owing to some slight modification will yield entirely dissimilar results in mixing, molding and firing. Given in some particular locality a deposit which under certain treatment yields a definite and constant result to man's handicraft, it is doubtful whether, if the deposit becomes exhausted, exactly similar results could be produced elsewhere even by the selfsame artisans. It is to some extent owing to these reasons that the great potteries of the world maintain their distinctive styles, and also lose them as in the cases where the finest modern examples are inferior to the older work. The loss of the art of the ancients, renowned for their pottery and glazes, is possibly due to this cause more than to the inability of modern science and industry to duplicate their cunning in artifice. For the reasons outlined we find our clays with all shades of variation in their useful properties.



The Alsip Double Cable System, Carrying Brick on Pallets to Racks on Either Side of Machine.

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*United States Department of Agriculture, Bureau of Chemistry—Circular No. 17. Harvey W Wiley. Chief of Bureau.

PRODUCTION AND IMPORTATION OF CLAYS.

The following figures taken from the statistics of the mineral resources of the United States, compiled by the U. S. Geological Survey for the year 1902, show in an interesting way the condition of our clay-producing industry: Total imports of clays, 168,551 long tons, valuation $1,154,805; total domestic production of clays, 1,299,426 long tons, valuation, $2,061,072.

Altogether the total amount of clays imported into this country is between one-seventh and one-eighth of that produced here, while the valuation of the latter is less than twice that of the former. Doubtless in time the rich clay deposits of America will be developed to a point where this considerable importation of expensive clays will cease, and one of the factors in this progress will be a better understanding of the useful qualities of clays.

KINDS OF CLAY.

With few exceptions residual clays, or those derived from the decomposition of the rocks in place, are fit only for the commoner grades of brick and earthenware. Nearly all the smoother and fine textured clays are formed from the sedimentary plastic products of rock decay. These beds may be, however, of a widely different nature, some being sandy, or to use a technical expression, "lean," and others very fine-grained, plastic, and "fat." By the accumulation of beds of fine-grained material, one on top of another, the clays become consolidated into shales. These shales which are much used in certain localities are sometimes as hard as rock, but when ground and mixed with water yield a plastic, workable mass. In actual pottery practice it is usual to mix several different kinds of clays, thus combining the useful qualities of each. Probably more than 90 per cent. of all manufactured articles are molded of a mixture of at least three clays.

The various sorts of clays have come to be distinguished by different names; thus one hears of stone-ware china, and brick clays; pipe clays, ball clays, fire clays, and kaolins. These distinctions are not very exact, and in most cases merely show the local use to which the clay is put. China clays are usually white or burn white, and, when mixed with ball clay, ground feldspar, and quartz, are used in the manufacture of porcelain and other forms of white ware. Ball clay is the name given to very fat plastic clays which can be formed and molded into shape and which will dry out to a mass of high binding power without suffering deformation. Used by themselves ball clays will rarely stand the fire well, but for mixing with good burning clays of low binding power and little or no plasticity they are very necessary. Florida supplies these clays to a considerable extent, but for special reasons they are at present very largely imported from England and Germany. Kaolins are made up of fine particles of the mineral kaolinite which results from the decomposition of feldspar. Kaolin, which, chemically speaking, is a silicate of aluminum, is supposed to be the essential ingredient in all clays, and it is not uncommon to read in various publications that kaolin furnishes the active clay base in all plastic clay. Recent researches made in the Division of Tests of the Bureau of Chemistry, however, show that such statements do not express the whole truth in the matter. Fire clays, as their name signifies, are those which do not fuse or melt except at very high temperatures, 3,500° F. and over; although these clays are generally used in the manufacture of fire bricks, muffles, and linings for furnaces, they can be used for decorative purposes, as their very stability in the fire makes them easy to burn.

PHYSICAL PROPERTIES OF CLAYS.

We may now turn to the consideration of the physical properties of clay, taking them in the following order: (1) Plasticity; (2) binding power (tensile strength); (3) slaking; (4) air shrinkage; (5) firing qualities—(a) fire shrinkage (distortion), (b) fusibility, (c) color; (6) absorptiveness.

—*Plasticity.*—

It is a matter of common observation that the particles of all wet powders to a greater or less degree cohere. If we take ordinary clean, white sea sand, grind it to an impalpable powder and mix it with a certain amount of water, we shall have a mass just sufficiently coherent to ball together. If, however, we try to mold the wet mass into a form it quickly crumbles and shows itself quite unworkable. From this extreme up to the most plastic of the ball clays which will respond to every touch of the artist's hand and preserve every line of the graver's tool, we find among the fine-grained materials on the earth's surface every grade of variation.

The cause of this wonderful property has been much discussed by students of clay structure. Investigations carried on in the Division of Tests show that the effect is due to the presence of a certain proportion of particles which actually soften and become sticky under the action of water. It has been noted that purely crystalline particles do not make plastic masses, but there is another kind of matter than that which appears in a crystalline form. This is broadly defined as amorphous substance. Only one kind of amorphous matter, however, is active in producing plasticity. Glass is an amorphous, noncrystalline material, but powdered glass is no more plastic when wet than is sand. The particles which are active in forming coherent masses are highly hydrated, that is, they contain so-called water of combination, which disappears into some sort of porous structure too fine to be seen even under the most powerful microscope. Clays, even when thoroughly dried in the sun and air so that they have every appearance of being dry powders, will sometimes contain as much as 12 or 14 per cent. of this combined water. If the clay is heated to a sufficiently high temperature to drive off this water all plasticity and clay likeness is gone. Thus brick dust is no more plastic than sand or glass-powder. The particles have not become crystalline by heating, but the active hydrated particles have been changed into dead amorphous ones. These active particles which become coherent when wet are called *colloid* (which means glue-like), to distinguish them from the inactive crystalline and amorphous grains which are also present in almost every clay.

—*Binding Power.*—

It is this property which provides strength in the air-dried clay so that articles fashioned of it can be tranported to the kiln without crumbling and breaking. It is a very important quality and the purer clays and kaolins are often deficient in it. The property is tested in the laboratory by molding briquettes of a special shape, which after drying out are pulled apart in a machine designed for the purpose. The strength of different kinds of clays, as determined in this manner, is given in the following table:

—Tensile strength of clays.—

	Pounds per sq. in.
Pure kaolins	5-20
Common brick clays	30-100
Pottery clays	100-500
Ball clays and other very plastic clays	200-500

It is a curious fact that though high binding power is usually associated with high plasticity, this is not invariably the case. Some of the plastic clays of New Jersey in use in the potteries are of comparatively low binding power. This can be explained, however, by the colloid theory as outlined in the preceding paragraph better than by any other theory as yet advanced. There are various kinds of particles which assume to varying degrees the soft, almost viscous, condition which leads both to plasticity and binding power. In order to illustrate what is meant let us suppose that an inert, non-plastic powder were to be mixed with egg albumen on the one hand and with a glue solution of equal viscosity on the other. Masses of some plasticity would be obtained in both cases, but on drying out the binding power of the glue would be much higher than that of the albumen. The difference in such a case is attributable solely to the kind of cementing material which is present and its individual character. In addition to this it is undoubtedly true that the shape and size of the particles, and the proportional amount of plastic and non-plastic particles present have an important influence on these properties.

—*Slaking.*—

The slaking of clays refers to the quality possessed by some of them of rapidly disintegrating and falling to powder when lumps are thrown into water. Such clays are usually less dense, that is to say bulk for bulk they are less heavy than those which do not possess this property. Clays that slake, if touched to the tongue, will adhere to it, sometimes so strongly that it is painful to draw the tongue suddenly away. Both this effect and the slaking are caused by a vigorous indrawing of water into the porous structure of the particles. In more dense clays that porous structure is already "stuffed" sometimes with water and quite often with other substances both of organic and inorganic origin. The truth of this is readily shown by a very simple experiment. Glycerin is not absorbed into the clay structure rapidly enough to produce slaking; if, therefore, a lump of slaking clay be soaked in glycerin over night it can be transferred to water in which it will then be found to behave as does any non-slaking clay.

Clays that have been slaked and the powder molded into masses and air dried do not again disintegrate when wet, as the porous structure is then sufficiently saturated with water to decrease the action. The power to slake readily is often a great advantage, as it enables hard clay masses from the bank to be disintegrated by weathering and thus does away with the necessity for elaborate grinding processes.

—*Air Shrinkage.*—

Air shrinkage is that which takes place during the air-drying of a clay mass and is caused by the evaporation of the water, both that which has been used in mixing and a portion of that which the clay contains. As has been explained, very plastic clays possess a greater number of the active hydrated particles with a porous structure, so that we should expect these clays to exhibit a higher shrinkage than lean clays, and this is actually found to be the case. Everyone is familiar with the way glue-like bodies shrink on drying. This shrinkage varies in different clays from 1 to as high as 10 per cent. We now begin to see why the skill of the potter is highly taxed even before his ware goes to the kiln. If he selects a clay which from its plasticity and binding power is all that could be desired, it is probable that its high air shrinkage will cause it to deform and check (crack) on drying out. Sometimes by very slow and careful drying the danger can be avoided, but usually another leaner material, sometimes even sand itself is mixed in just such an amount as to reduce the shrinkage without too far lowering the other useful qualities.

—*Firing Qualities.*—

Many difficulties must be overcome in order to obtain a clay mixture which will burn well in the kiln and produce the desired result with the utmost economy. Of course the selection of the right kind of kiln and the proper control of the fire is of paramount importance. Such questions can not be treated in an article of this nature and larger works on the subject must be consulted.

Fire Shrinkage.—After a clay mass is thoroughly air-dried it undergoes a further shrinkage on heating as the water of combination already referred to is driven out and the particles softened by incipient fusion followed by vitrification, draw together and adhere. By incipient fusion is meant the point at which the particles become soft in the fire and by vitrification the point at which they fuse together. Common bricks and earthenware are baked only to this first point and retain an open and porous structure, the bond of incipient fusion being sufficient to form the clay into tough, stone-like materials. Paving bricks and many kinds of stoneware are vitrified.

Fusibility.—It is well known that if pure crystalline substances are heated they become gradually hotter without apparent softening until a certain critical thermometric point is reached at which the crystals suddenly melt and the mass assumes a liquid condition. If, on the other hand, a noncrystalline, amorphous substances like glass is heated, it begins very soon to soften and continues to grow continually more viscous until it finally flows. In other words, crystalline substances have sharp and definite melting points while amorphous substances have none at all, but soften gradually to the point of flow. As has already been mentioned, there is evidence to show that clays are mixtures of crystalline and amorphous particles in varying proportions, and it may now be further pointed out that, in the fire, clays behave just as we should expect such mixtures to do. If clays had a sharp melting point, owing to the difficulty of exact control of temperature, the potter would be in continual danger of melting his ware to formless lumps, while on the other hand he could obtain no vitrified bond unless the particles first softened to the point of incipient fusion. As a matter of fact in most clays the point of incipient fusion is lower by 100° to 500° F., than the point of vitrification, and this point in its turn may be many hundred degrees below the point of deformation and flow. Common brick clays will usually fuse at 2,000° F., while many of the better grades of clays will stand 3,000° without viscosity or deformation, while fire clays go as high as 3,500° and even more. It will be apparent from what has been said that a clay which will stand a considerable increase in temperature above a given point without softening to the point of deformation and flow will be—other things equal—the safest and easiest clay to burn.

We have now to consider briefly the elements which actually determine the fusibility of clay. Quartz is an oxid of silicon formed by the association of two atoms of oxygen, with one atom of the element silicon to form the oxid silica, which is expressed by chemists by the symbol SiO_2. Silicon is one of a group of elements which always form acid oxids, so called because if heated with the proper amount of certain alkaline or basic oxids like lime, which is an oxid of calcium (CaO), they will combine to form fusible slags which are neutral, showing neither an acid nor an alkaline character. Silica has a very high melting point, and lime an even higher one, so high in fact that it withstands the extreme temperatures of the electric arc. If, however, the two oxids be mixed together the fusing point is lowered. Thus in clays the point of fusion depends upon the amount of fluxing agents present, such as the basic substances, iron oxid, soda, potash, lime, and magnesia; and, although fineness of grain is also an element in determining fusibility, the point of fusion will usually fall with the percentage of these basic substances present. For this reason the common red brick clays which get their color from iron oxid are, as a rule, of low fusing point.

Color.—The color of a clay before it is burned is of little importance except in so far as it serves to indicate the presence of iron. In the kiln, however, except in perfectly white clays which burn white, color changes invariably take place. Many black clays stained by organic matter burn white, while others burn to reds, buffs and cream colors. Nothing of importance has ever been accomplished technically in causing a dark burning clay to burn white. It is known that an increase in the amount of lime will produce a paler burn if the color is due to iron, but on the other hand, such an admixture has certain deleterious effects, such as lowering the fusing point unequally.

—*Absorptiveness.*—

The power that some clays have to rapidly absorb water and other substances, has already been discussed. This property is frequently made use of in the arts. In addition to this action certain unctuous varieties of clay which will not usually adhere to the tongue have the power of removing coloring matters from solutions by actually adhering to the fine particles of matter held in suspension and "sweeping" them away. These clays are known as fullers earth and are much used as clarifying and bleaching agents. They are usually of a grayish-green color- very soft and greasy to the touch, and if placed on the tongue they appear to melt away.

PURIFICATION AND TREATMENT OF CLAYS.

In ordering brickmaking the clays are not usually given much preliminary treatment, as it would increase the cost of manufacture too much. In the manufacture of high-grade and art pottery, however, it is often worth while to go to any length in the effort to obtain an even standard of excellence. By means of grinding, washing, and sifting the clays are reduced to the even and uniform texture which is absolutely essential to the production of high-class work. In addition to these processes it has been found that by allowing the clay masses which have been worked up with water to the consistency of a pasty dough to remain quietly in this condition for long periods, months or more, the binding power and plasticity increase. This is called tempering or ripening the clay and has been ascribed by some observers to bacterial action. It will readily be seen, however, that according to the colloid theory, as already outlined, the effect gained is caused by the gradual softening of the active particles under the influence of water.

A number of researches have been carried on during the last few years in an attempt to find cheap and economical methods for increasing the useful properties of clays. One experimenter, having occasion in 1901 to seek a clay of the highest possible binding power, soon learned that the material suited to this purpose could only be obtained in Europe, and more particularly in Germany. This experimenter immediately began to seek for a method of treatment for local clays which would develop the useful qualities necessary for his purpose. After some experimentation it was found that by a preliminary soaking in a 2 per cent. solution of tannic acid, or the ordinary catechu of commerce, the binding power and plasticity of most clays were very much increased while the air shrinkage was diminished. Even infusions of dried leaves and straw were found to produce the effect to some extent. The process was called the "Egyptianizing of clay" on the somewhat fanciful theory that the ancient Egyptians used straw in brickmaking more on account of the strength given by the infusion than by the fiber.

This subject was investigated in a general way in the Division of Tests, and it was found that many substances have the effect of producing increased binding power and apparently increased plasticity in some clays. This is shown by the tensile strength tests given in the following table, made on a buff-baking brick clay. Each result is the average of thirty to forty briquettes, from ten to twelve having been made by each of three operators.

—Average tensile strengths of treated clays.—

	Pounds per square inch.
Water	65
Two per cent. solutions of—	
Tannic acid	153
Dilute ammonia	147
Alum solution	98
Iron alum solution	118
Dilute hydrochloric acid	63
Dilute caustic alkali (KOH)	80

Many other substances were also tried, but as the effects were not in all cases decisive they have not been included here. It will be observed that among the solutions tried, tannic acid, ammonia, and the alums were the most active in increasing the tensile strength.

On first thought these results are by no means easy to interpret. Tannic acid and the alums are astringent and of decidedly acid reaction in their water solutions, whereas ammonia is decidedly alkaline in reaction and detergent in its action. On the other hand, if alum is added to clay suspended in water to form a "slip," it will have a flocculating or coagulating effect upon the colloid particles, causing them to settle rapidly. Tannic acid and ammonia appear, in most cases, to have a deflocculating effect, and some clays suspended in dilute ammonia, show no indication of settling after the lapse of several months. It is known that the colloid structure of clays is selective in its action, that is to say, tannic acid and ammonia will be taken out of solution and retained in the porous particles of a clay. This absorption then probably affects to some extent the flotation of the particles. In the writer's opinion the action of reagents in increasing the binding power of clays is twofold: (1) deflocculation produces a better distribution of the colloid particles or a so-called "puddling" of the clay; (2) the colloids present are modified and developed, if not actually formed, by the reactions which take place. A further discussion of this interesting subject is of too technical a nature to be given here, but the question will be more fully treated in other publications.

USE OF CLAYS.

The various uses of clays is shown by the following list originally compiled for the Mineral Resources, United States, 1891, published by the U. S. Geological Survey:*

Domestic.—Porcelain, white earthenware, stoneware, yellow ware, and Rockingham ware for table service and cooking; majolica stoves; polishing brick, bath brick, fire kindlers.

Structural.—Brick, common, front, pressed, ornamental, hollow, glazed, adobe, terra cotta; roofing tile; glazed and encaustic tile; drain tile; paving brick; chimney flues; chimney pots; doorknobs; fireproofing; terra cotta lumber; coping; fence posts.

Hygienic.—Urinals, closet bowls, sinks, washtubs, bathtubs, pitchers, sewer pipe, ventilating flues, foundation blocks, vitrified bricks.

Decorative.—Ornamental pottery, terra cotta, majolica, garden furniture, tombstones.

Minor uses.—Food adulterant; paint fillers; paper filling; electric insulators; pumps; fulling cloth; scouring soap; packing for horses' feet; chemical apparatus; condensing worms; ink bottles; ultramarine manufacture; emery wheels; playing marbles; battery cups; pins, stilts, and spurs for potter's use; shuttle eyes and thread guides; smoking pipes; umbrella stands; pedestals; filter tubes; caster wheels; pump wheels.

Refractory Wares.—Crucibles and other assaying apparatus; gas retorts; fire bricks; glass pots; blocks for tank furnaces; saggers; stove and furnace bricks; blocks for fire boxes; tuyeres; cupola bricks.

Engineering Works.—Puddle; Portland cement; railroad ballast; water conduits; turbine wheels.

THE TESTING AND EXAMINATION OF CLAYS.

Although the testing of clays does not properly fall within the scope of a paper of this nature a few words on the subject will probably be of interest. There is a very widespread impression that the nature and uses of a clay body will be revealed by a chemical analysis alone. It is true that combined with other data the results of complete chemical analysis are always of value, but the fact remains that clays of widely different properties will have almost identical chemical composition and vice versa. This is illustrated by the analysis of two samples, one a fat ball clay from Florida, and the other a rather lean fire clay from Kentucky.

—Chemical Analysis of Two Clays.—

Constituents.	Florida ball clay.	Kentucky fire clay.
	%	%
Silica	47.01	47.70
Alumina	38.50	38.47
Iron oxid	0.35	Trace
Lime	0.08	0.112
Magnesia	0.15	0.11
Potash	0.83	0.57
Soda		
Combined water	13.78	13.03

In addition to the usual chemical analysis, it is customary to examine clays by methods of so-called *rational* analysis, in which the effort is made to distinguish between the silica which is combined with alumina as clay substance and that which is free as quartz or sand While somewhat inaccurate such analyses are of undoubted value.

The amount of water required to be mixed with air-dried clays to bring them to just the proper consistency for molding into forms varies greatly in different clays. It is evident from from what has been said in an earlier paragraph that the smaller the amount of water present the less the danger from air shrinkage and the greater the economy of working, especially when artificial heat is used in the drying process. In a thorough report on the useful qualities of a clay this property should always be tested. The physical characteristics which it is necessary to test in a complete examination of clay are best shown by the following laboratory form:

Physical characteristics of clays.

No.	Kind of clay.	Water required.	Tensile strength.		Air Shrinkage.	Fire shrinkage.	Temperature required for			Color when burned
			Average.	Maximum			Incipient fusion.	Vitrifaction	Viscosity.	
		%			%	%	°C	°C	°C	
722	Brick, ..	17.4	65	72	2	2	1140	1430	1600	Buff
925	Surface*	28.0	35	40	3	....	1000	....	....	....
926	Blue	19.0	130	145	7	8	1140	1430	1600	Coffee
930	Fire.....	18.5	110	115	3	2	2500	....	....	Cream whites

* Melted at 1400° to a slag.

When a sample of clay is sent to the laboratory to be tested the following rules should be observed by the shipper. The sample should not weigh less than 30 pounds in its air-dried condition, and it should represent as nearly as is possible the average quality of the deposit from which it is taken. The laboratory should be put in full possession of such informatiion as is available both as to the extent of the deposit and the purpose for which the report is desired. In some cases it happens that the interest in a clay is centered in its ability to hold water, for use in building canals or irrigation ditches. Clays vary as much in their permeability as in other qualities, but it is manifestly a waste of the chemist's time to investigate the firing qualities of a clay when simple percolation tests are all that is necessary.

ALLERTON S. CUSHMAN,
Chemist, Division of Tests.

APPRENTICES SENT TO THE WORLD'S FAIR.

The Midvale Steel Company, of Germantown, Pa., is sending its apprentices to the World's Fair in gangs of eight—seventeen gangs in all—with expenses paid and wages continued from the time they leave Philadelphia until their return. One gang leaves Philadelphia every Saturday noon, stopping at Washington to see the navy yard and other points of interest. They travel in strictly A1 style. While in St. Louis they will stop at the Westmoreland Hotel. About sixty of the boys have already visited the Fair, and they are a bright, wideawake lot of fellows. Within two weeks from the time they return to Philadelphia each will be required to write a letter to the president of the company, C. J. Harrah, stating what he has seen, and his impressions of the great exposition.—*American Machinist.*

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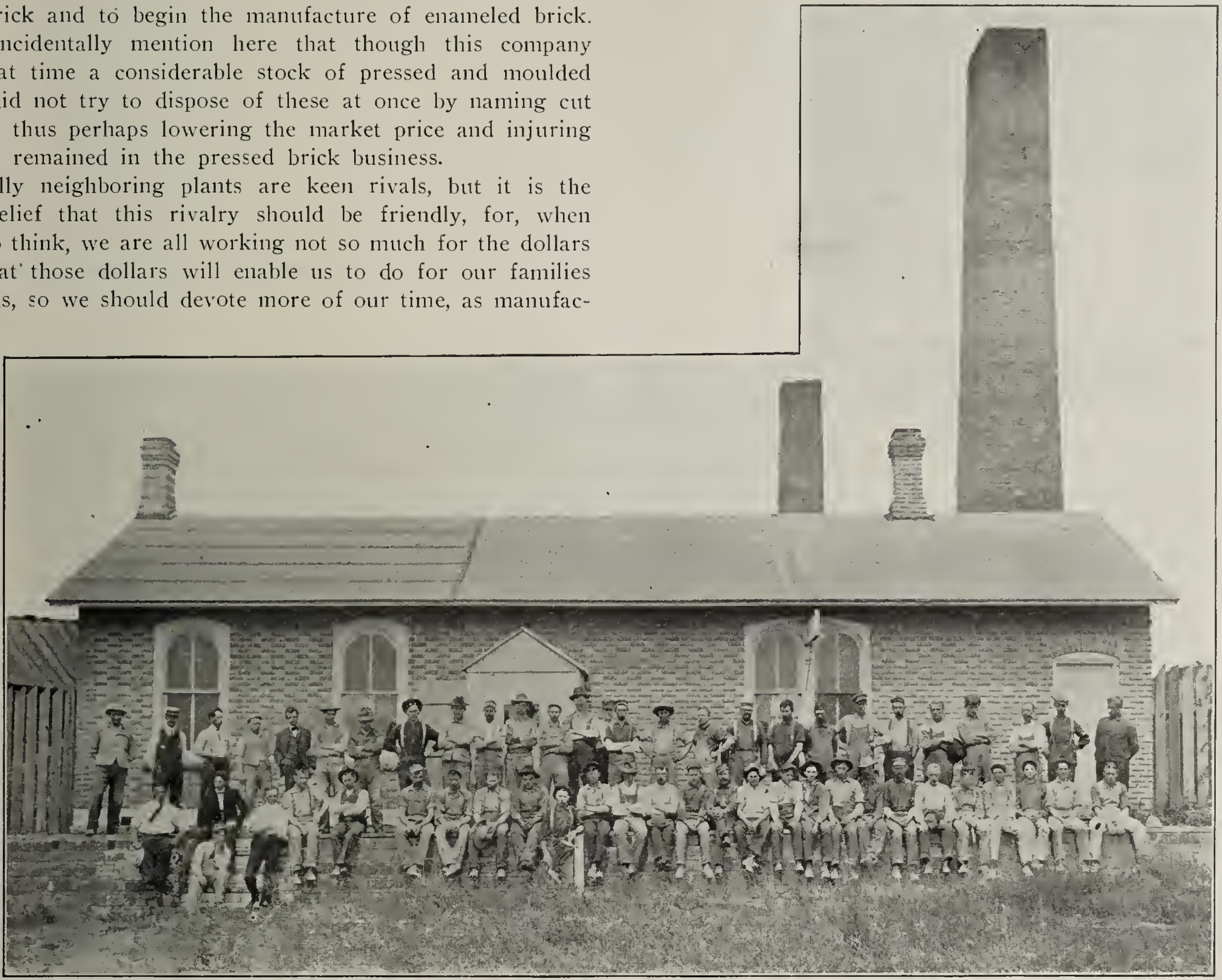
*Clays of the United States East of the Mississippi River, by Heinrich Ries, U. S. Geol. Sur., Professional Paper No. 11.

Written for The Clay-Worker.

TIFFANY ENAMELED BRICK.

WE ARE pleased to present to the readers of The Clay-Worker a view of the factory of the Tiffany Enameled Brick Company, with some of their employes in the foreground, and with it a brief sketch of the enterprise which has proven one of the most successful in its line in America. The Tiffany Press Brick Company was incorporated in 1884 to manufacture press brick at Momence, Ill., a town fifty miles south of Chicago, where they had located extensive and valuable clay beds. The company made a reputation in that line of work second to none, shipping its goods north, south, east and west for hundreds of miles. Later on, about 1893, as more and more pressed brick factories were established around about the country and its territory became more and more local (Chicago being its principal market), it was decided to drop the manufacture of pressed brick and to begin the manufacture of enameled brick. Let me incidentally mention here that though this company had at that time a considerable stock of pressed and moulded brick, it did not try to dispose of these at once by naming cut prices and thus perhaps lowering the market price and injuring those who remained in the pressed brick business.

Generally neighboring plants are keen rivals, but it is the writer's belief that this rivalry should be friendly, for, when we stop to think, we are all working not so much for the dollars as for what those dollars will enable us to do for our families and friends, so we should devote more of our time, as manufacturers, to increasing the use of the kind of material that we make, and by both individual and collective effort see that more bricks are used where they should be and strive to turn out a quality of product that will not make the builder regret that he did not use stone or some other material.



A Portion of the Factory and Employes of the Tiffany Enameled Brick Company, Momence, Ill.

When this company started to make enameled brick some eleven years ago, it made the seventh company then manufacturing in this country. Of these original seven, five dropped out for the reason that, from one cause or another, they could not make their goods at a profit. Two or three others took up the manufacture, but hardly lasted long enough to get their goods fairly on the market. Several besides these have in more recent years entered the field and now there are practically the same number (seven) doing business that there were when the Tiffany company began.

"We have had all sorts of schemes presented to us" said Mr. Van Inwagen, the present manager of the plant, "for making enameled brick, from $5.00 per thousand upwards, and have always investigated such schemes, but not a single one have we ever found made as good brick as we are already turning out, nor as cheap as our present method, and our advice to the brickmaker who is successful in his own line, is to leave the manufacture of enameled brick alone for success is rare, failures many, and the loss very heavy."

The demand for enameled brick has increased steadily of late years as its merit was more and more appreciated by the building public, but there is plenty of competition and any one in this line will testify that he has no walk-away when it comes to the sales side of the business; for, besides the competition of those who already make this ware, there are competitors in those who make and handle tile, marble, terra-cotta and cement ware, as well as the imitations of tile, marble, etc. While the Tiffany Enameled Brick Company have no means of knowing what their competitors are doing in the way of quantity of output, sales, etc., they themselves have suffered no falling off in orders on account of this being a presidential campaign year, the reason for this largely not only being due to the growing demand but to the educational work and hard work done on the sales side of the business, in which they include proper advertising, but more than anything else to satisfying their customers, thus retaining those already with them and, through this, gaining new ones.

Their office building, located as we have said, at their factory, where it should be, is built in Flemish bond out of culled enameled bricks that have been rock-faced, and which they have little trouble in disposing of at the price of pressed brick. In the photograph are shown the faces of some of their employees who were with them when the factory was established, some twenty years ago, some of whom have sons now working for the company that were born after that time, and others that have been with them ten, twelve and fifteen years.

The president, Mr. J. Van Inwagen (formerly of Chicago) was the original starter of this company; their superintendent, Mr. E. Hardy, has been with them since 1893, and their assistant superintendent, Mr. L. J. Tiffany, for the past nineteen years. This is a record seldom equalled and bespeaks wise and liberal management that in itself deserves success. It is little wonder that the Tiffany enameled brick are now recognized in the building world as a standard and staple product.

ESSENTIAL FEATURES OF DRAINAGE DITCHES.

THE EXPERIENCE of all those who have attempted the reclamation of level lands requiring large artificial outlets, is that shallow ditches of whatever kind fail to give satisfactory drainage. Shallow ditches for farm drainage may sometimes give sufficient relief, but must be supplemented by deeper channels in order to keep the lower soil in condition to receive and care for the water coming from higher levels. It is a matter of history that no substantial progress has been made in thoroughly reclaiming such land until deep ditches have been constructed.

There is quite a common opinion that, if a certain drainage basin requires a ditch of a given size, as the ditch is extended through a similar country the size and capacity should be increased in direct proportion to the additional acreage draining into it. This, however, is not true. A careful study of the watershed of streams and a comparison of the same with their channels shows that these channels do not increase directly as the area increases, but that there is a varying ratio existing between the two. For example, at a point on the stream where the drained area has increased twenty per cent., the channel is enlarged only five per cent. Where the area has increased forty per cent., the channel is enlarged only ten per cent. This is particularly true of streams where the drainage of the additional area is brought to the main stream in comparatively small quantities. If however, the water is concentrated and discharged in large volumes, the increase in the size of the receiving ditch must be made more nearly in proportion to the volume of water added. The reason for this apparent paradox is that the inflow is distributed over the entire length of the discharging line. Water which is near the main outlet enters first and is discharged before the water from a more distant field reaches this point. The various streams from different distances within the watershed reach the main at different points along its course, so that, in effect, the one large main takes the place of a large number of separate and smaller outlets. If the size of the ditch was increased in direct proportion to the increase of the watershed along its line as we proceed downward, it would soon reach a size not at all commensurate with economy or in accordance with facts commonly observed in drainage investigations.—*C. G. Elliott, Drainage Expert, in Bulletin No. 147, U. S. Department of Agriculture.*

THE WATERSHED.

In the work of land drainage, embracing a large or small area of land, the capacity of the drains must not only be proportioned to the extent of the land to be directly effected by the drains when constructed, but should also include the water that is likely to fall on territory outside that will flow on the land which is intended to be drained, which is commonly called the "watershed." For example "A" may wish to underdrain a twenty-acre field, the outlet is good, the lay of the field is favorable, the size of the tile necessary to carry the water that falls on the twenty acres is easily determined. But how about the "watershed?" Yes, eighty acres or more of the land adjoining will shed the surface water on the twenty-acre field in question. That is, the twenty-acre field is the natural outlet for the surface drainage of the higher land adjoining. Provision must be made to receive and carry this water through the drains to the outlet, which will require larger sizes of tile. But the area or surface to be drained, including the watershed, is only a part of the conditions to be considered in determining the size of the tile. An important factor is the water flow from the adjoining land onto the twenty-acre field, does it flow on to the land in the form of a branch or branches, or is it a wide spread even surface, the water flowing from higher levels to lower levels gently? If the water flows onto the land in the form of one or more small streams, then it will be sufficient to increase the size of the tile that carries the stream designated. One large main drain may be all that is required, if the tile is large enough, otherwise if the water is widespread in its flow then it follows that all the drains that receive the watershed need to have a capacity in proportion to the amount of water likely to come to them.

Another condition which needs to be considered in determining the size of the tile necessary to drain the twenty acres and also carry off the watershed water, is the thoroughness of the work planned for the twenty acres. Does the work embrace the drainage of the field by having parallel lines of drains, so as to underdrain every rod of the surface to a depth of three or four feet? If so, the tile do not need to be so large as they would if only a few lines of tile are to be put in the depressions of the field. The water flowing onto the field gently from the adjoining land will be taken up by the drained soil and held, in part, as capillary water, the free water passing away slowly through the soil and subsoil to the drains. The water passing through the soil and subsoil meets with a resistance that retards the flow, to an extent that drains will run freely for days after a long continued rain fall. In a thorough system of drainage the tile may be smaller for a given surface including the watershed, than for the same surface if only a few lines are laid. The fall or inclination has much to do with the size of tile necessary to do efficient work. The character of the work done in the construction of the drains is an important factor to be considered in the selection and size of tile needed. Drains laid with a regular fall and the tile laid evenly and bedded firmly in line, avoiding anything like shouldering at the joints, other things being equal, will have a much greater water-carrying capacity than drains carelessly constructed.

DEPTH OF ROOTS.

Few persons, though familiar with plant growth above ground, are informed as to the depth that the roots of our crops wlll penetrate into a deeply drained soil. It is thought by many that a soil made open and arable to the depth of ten inches is sufficient for the roots of growing crops to penetrate. Professor W. O. Atwater, in the *American Agriculturist,* writes as follows, on the "Extent and Depth of Roots:"

"I have some roots of timothy, clover and other plants, dug from a heavy clay soil. * * * I have traced the roots of timothy to a depth of two feet and four inches, and the clover three feet and two inches.

A number of years ago a very interesting german farmer named Schubart. made some interesting observations upon the roots of plants as they grow in the field. An excavation five or six feet deep, or more, was dug in the soil so as to leave a vertical wall. Against this wall a jet of water was played by means of a garden sprinkler; the earth was washed away and the roots of the plants growing therein laid bare. The roots thus exposed in a field of rye, in one of beans, and a bed of garden peas presented the appearance of a mat or felt of white fibers extending to a depth of about four feet. Roots of wheat sown September 26 and uncovered April 26, had penetrated three and a half feet, and six weeks later about four feet, below the surface. Professor Johnson states that the roots of maize have been traced to a length of ten feet in a light, rich, sandy soil. Professor Stockbridge washed out a root of common clover, one year old growing in an alluvial soil and found that it descended to a depth of ten feet."

From the foregoing we cannot expect that maximum crops can be grown until the soil is made open and porous to a depth of three or four feet by means of underdrainage, where it needs it. More drain tile! More drain tile!! well laid, is what is most needed to bring much of our agricultural land into the best possible condition to grow maximum crops.

DRAINAGE OUTLOOK IN MINNESOTA.

The interest in land drainage in the state of Minnesota is up to fever heat. It is said that so many drainage systems have been planned within 100 miles of Minneapolis to be constructed during the year 1905, that it will be difficult to find contractors enough to handle the work.

Many of the ditches are too large to be dug without the use of a dredging machine. At Litchfield, Minn., September 28, about fifty miles of open ditch will be let, and later in the fall other ditches will be let. Those interested in securing some of these jobs will address John Goynor, Litchfield, Minn. It is needless to suggest that after the open ditches are constructed, drain tile will be needed to complete the work.

SOME GENERAL CONCLUSIONS.

During the year 1903 the agricultural department at Washington has had some drainage experts in the field, making experiments intended to guide in the future the work in drainage and irrigation. A late report, Bulletin No. 147, after giving a detailed statement of the experiments at different points, gives a summary of general conclusions, from which we make the following brief extract:

1. Surface and soil water should be intercepted before entering a farm, if it is possible, rather than drained from it. This can be done if the drain is so located as to intercept the underflow.

2. Alkali can be washed out of land and prevented from accumulating by means of underdraining. Where the soils are deep, loose and contain but little clay the drains should be laid four or five feet deep, and may be from 200 to 300 feet apart. more compact soils three to three feet five inches deep and drains laid from 100 to 150 feet apart. When underdrained the water of winter rains and summer irrigation will steadily reduce the alkali in the soil. Drain tile will come into more general use for this work as soon as plants for its manufacture are located more conveniently to the area needing this drainage. Open trenches should be used only as outlets.

3. The pumping of drainage water where there is no convenient outlet, is as practical in irrigated areas as it is in the reclaimation of low lands in the humid areas where gravity outlets are impracticable.

4. Drainage is an essential part of the improvement of irrigated lands in some localities.

5. The drainage of farm lands in humid belts can be effected by the enlargement of the arterial streams which receive the drainage, and by the construction of new ditches where the natural streams are insufficient.

6. The ultimate removal of the surplus soilwater from the soil is the end sought. At the same time, the proper conservation and distribution of the water should be considered more fully than it has been in the past.

7. The organization of drainage districts under the provision of state law to permit the drainage of large areas, is very important. The need of co-operation among land owners for comprehensive drainage is felt whenever such work is attempted.

IOWA DRAINAGE ASSOCIATION.

A special effort on the part of a few men who are interested in land drainage, resulted in a very interesting meeting recently held at the Agricultural College, Ames, Ia. An organization of a state association was effected. The object of the organization is to secure as far as possible, a unity of effort in securing the passage of a state drainage law which will adequately meet the needs of the state. A bill is to be drafted and presented to the legislature by a committee appointed by the association. It is pretty generally conceded that there is urgent need for a good drainage law. Hence it will be to the interest of every owner of land that needs drainage to help in securing such a law. The membership fee is one dollar.

DRAINAGE OF THE GREAT VALLEYS.

The drainage of the Missouri river bottom is receiving the careful attention of men of foresight. The work is confronted with some difficulties that will require the co-operation of effort on the part of the land-owners. The only drawback to the full development of these lands for agricultural uses is lack of drainage. It is a broad, fertile valley, of almost inexhaustible fertility, that only needs the work of a broad, comprehensive system of drainage to make every acre available for crop production of the highest order. It is only a question of time when the lands of the Missouri and the Mississippi valley must be drained and protected with levees, so that these valuable lands may be brought into profitable cultivation to feed the millions yet to be.

DRAINAGE NOTES.

The demand for drain tile has been unprecedented this season so more and more, and still the demand is not supplied. Some who have it in mind to draw extensively are placing their orders for drain tile to be delivered on board cars in October and later on, intending, no doubt, to draw and distribute them this fall, when the ground is firm. A good idea.

Think of it, one man planning to put in fifty miles of tile drains and another sixty and another one hundred. Verily, the "world do move," as the colored divine would remark.

A little more attention should be given at some tile factories in securing smoother ended tile.

We prefer to lay tile up-grade, beginning at the outlet; others prefer to lay down-grade, and claim that in so doing they keep out any floating trash when there is quite a water current. Some way, we have thought that the tile could be laid truer to grade by laying up-stream. We use a grading scoop to pare off any unevenness and shovel a little clay on to the side of the tile and see that the tile is firmly bedded.

When the drain is left over night or any time during its construction, lay a few tile loosely, stopping the upper end of the last tile thus laid. The open joints will allow the water to enter the drain without carrying anything in that might afterwards obstruct the flow.

As a rule, cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted," "For Sale," etc., columns a means of satisfying their needs.

MID-YEAR MEETING AT THE WORLD'S FAIR.

ARRANGEMENTS FOR A WEEK OF SIGHTSEEING AND GOOD-FELLOWSHIP BEGINNING OCTOBER 3..

THE NATIONAL Brick Manufacturers' Association having decided to hold an informal meeting at the St. Louis World's Fair the first week in October—3d to 8th—the Exposition management has decreed that Wednesday, October 5th, shall be observed as BRICKMAKER'S DAY. The occasion will be duly and properly celebrated by fitting ceremonies, which will be inaugurated at the Clay Industries Exhibit in the Mines and Metallurgy Building at 10:00 A. M. on that day. All visiting brickmakers, whether members of the N. B. M. A. or not, will be appropriately decorated if they will make themselves known by registering at the N. B. M. A. exhibit, which will be headquarters during the week. A most cordial welcome will be extended to every visiting clayworker. A daily program can be arranged each morning to suit the bent of the individual tastes of the visitors, who, after their trips to the various buildings and features of the great display which appeals most to them, can reassemble at the Clay Industries Exhibit at stated intervals.

YOU ARE INVITED.

Brickmaker's Day at the World's Fair, Wednesday, October 5.

In honor of the brickmakers who will gather there at that time, the World's Fair Officials have designated Wednesday, October 5, as Brickmaker's Day, and the event will be fittingly celebrated. Every clayworker in the land is most cordially invited to be present and participate in the festivities which will extend through the week beginning October 3. It will certainly afford a rare opportunity for social pleasure, the interchange of trade lore and the enjoyment of the wonders of the Fair. For further particulars, see announcement and editorial in this issue.

KENTUCKY HOSPITALITY.

On the evening of Thursday, October 6th, there will be a formal reception at the Kentucky Building tendered to the members of the N. B. M. A. and accompanying ladies and friends and other visiting clayworkers by the Kentucky World's Fair Commissioners. Admission will be by ticket, which can be had on application to Wm. F. Keates, Commissioner, at the Kentucky Building, or to the Secretary of the N.B.M.A., at the Association's exhibit in the Mines and Metallurgy Building. It is needless to say that the occasion will be most delightful and will afford an evening of social intercourse under most charming surroundings, for the Kentucky Building is both palatial and elegant in all its appointments.

A NIGHT ON THE PIKE.

Other entertainment features, including A NIGHT ON THE PIKE, will be arranged for and carried out under the direction of the local committee composed of the following resident members of the N. B. M. A.: Anthony Ittner, Prof. H. A. Wheeler, M. F. Williams, Lemon Parker, J. M. Williams, H. W. Eliot, Gordon C. McNeil, S. Geijsbeek, Fred Talbott, W. C. Morris, Ed Rogers, John P. Camp, W. P. Grath, R. F. Grady, Robert Twells and George J. M. Ashby.

HOTEL ACCOMMODATIONS.

Owing to the crowded condition of the hotels, it is not deemed advisable to undertake to make any one hostelry headquarters, but on the contrary, the visitors will follow their personal fancy in arranging for hotel accommodations, and rendezvous at the Clay Industries Exhibit.

St. Louis has demonstrated her ability to take good care of all visitors in a satisfactory way. A majority of her homes have been opened to those who attend the Exposition, so there is no need of depending on the hotels, nor is it absolutely necessary to engage rooms in advance, though it is well to observe this precaution if convenient to do so. Those who are unacquainted with the city or have made no previous arrangements for accommodations, and desire further information can obtain same by addressing Prof. H. A. Wheeler, Chairman of the Advisory Committee, Clay Industries Exhibit, Block 20, Mines Building, World's Fair, St. Louis, Mo.

ODDS AND ENDS AT THE WORLD'S FAIR.

FOR YEARS terra cotta manufacturers had the difficult problem before them to make their ware of a color or shade to match flash brick. It is here stated to be difficult, because it is customary, in burning terra cotta to utilize oxidizing conditions, where as in making flash brick, it is absolutely necessary to employ reducing fires.

With this short explanation, the clayworker can readily understand the difficulties, as it is, besides, a well known fact, that two antagonistic conditions cannot be effected in a kiln at the same time. Even if periodically intermittent oxidizing and reducing fires were used, then the ware demanding oxidizing fire would be ruined by reducing fires and the ware demanding reducing fires would be spoiled by the reactionary influence of oxidizing fires. But that persistent experimenting leads to desired results, is evidenced by an exhibit which can be seen in Block 20 of the Mines and Metallurgy Building. This exhibit consists of two terra columns, in which the flash brick effect has been attained with a wonderfully realistic effect. so much so, that the average flash brick manufacturer will have to get on his mettle and hustle to produce as fine a genuine flash brick as is the imitation.

The above mentioned exhibit is made by The Northwestern Terra Cotta Company, Chicago, Ill.

In the Ohio State Exhibit, Block 20 of the Mines and Metallurgy building can be found three exhibits of the finest quality of dry clay press face brick; one of red shale brick, which up-to-date have not been equalled by any other manufacturer in the United States; the second one consists of an exhibit of gray brick which are of the finest quality that can be produced and the third one consists of a line of flash bricks which stand today unsurpassed. "Hurrah for the Ohio product," is my sentiment, and I am not a Buckeye at that.

As announced in THE CLAY-WORKER, the American Ceramic Society held its semi-annual or midsummer meeting at the World's Fair during the week of September 4 to 10. Was it an informal affair? Well, I should say so. The writer attended one of these informal noon hour sessions.

The discussion arose on account of some pieces of baked and fired ware having an opaque white covering. The composition was looked into, the baking temperature discussed, discourses were held relative to the opaque white covering as to whether it was a composition of matt glaze or a tin enamel. Opinions were freely offered, some of which were countenanced and some disputed. To go into complete details about this extemporaneous affair would make quite a long article but in brief the whole episode can be summarized:

Time, Noon Hour. Place, Rice Kitchen.
Baked Ware. Lemon Meringue Pie.

Do you know that there is a fine resting place at the headquarters of the National Brick Manufacturers' Association? It is located in a nice, quiet, cozy corner, has good seating capacity, and is an ideal place to hold meetings and consultations with your friends. You are fairly sure to meet some fellow-craftsman there at almost any time.

Some beautiful "Matt" glaze work is shown in the Mines building. The Hartford Faience Company show an elegant interior containing a beautiful mantle piece crowned with a charming panel containing figures representing "The Sun-Worshippers."

Space of the National Brick Manufacturers' Association, Where Visiting Clayworkers Will Rendezvous Oct. 3–8.

The word "Rookwood" means good value at all times, both in the old line ware as well as in the matt glaze line which the Rookwood people have gone into the last few years. Their exhibit shows some wonderfully fine pieces of matt glaze ware.

THE POTTER AT HIS WHEEL.

Don't miss calling on G. E. Ohr, of Biloxi, Miss., who has an exhibit in the Mines building. He is very skillful with the wheel, can make anything that can be made out of clay and possesses originality in more ways than one.

Watch his hands and his eyes when he works and you will find that he has little use for the eyes, so cunning are his hands. He could turn out the same wonderful pieces just as well if blindfolded. Mr. Ohr is known in the world of ceramics as the "No-two-pieces-alike potter." An inspection of his product, of which there is a small line at his exhibit, which is directly opposite the fine display of the American Clay-Working Machinery Company, and a much larger collection in the Alabama display, will convince anyone familiar with art pottery that he is entitled to distinction for his originality. He is in a class all by himself and his creations are unlike any other potter, either modern or ancient. For this reason, a piece of Biloxi pottery will prove a joy forever, especially to clayworkers who appreciate its novelty.

One of the leading architects from Stuttgart, Germany, was heard to say:

"I am now willing to hand the laurels to the American brickmaker. Such purity of colors, perfect shapes, fine corners and edges are things that you seldom see in our home-made bricks. I have seen the results myself and am convinced that we in Germany have a lot to learn from our fellow-craftsmen over here, when it comes to quality in making fine brick, our continuous kilns are not in it, excepting for cheapness of production at the sacrifice of quality.

"I am actually charmed with the beautiful bricks which I see here and if we only had such material to work with at home, we would surprise the world at large with the beautiful structures that could be erected with such perfect material..

"And one feature about your terra-cotta I admire most sincerely, and that is the boldness of design, which carries conviction with it, as it has plenty of high light and shadow and all that small, painfully minute, detail is omitted that we are accustomed to at home."

THE PREVENTION OF SCUM ON BUILDING BRICK.

In Block 33 Mines building can be found an exhibit of great interest to the mud brick manufacturer. Three panels are shown. No. 1 with whitewashed brick having no treatment. No. 2. Brick made from the same clay and treated with 30 per cent. of carbonate of barium (baryta) and with the brick so treated, still showing partial whitewash and No. 3, the same clay showing perfect brick, which had been treated, in the green state, with a special slip. This slip burns in the kiln to a light powder, which, with accumulated dust and ashes and primarily absorbed salts, falls off the brick as they are taken from the kilns, in turn producing perfectly colored goods.

The cost of this slip is very low, averaging about 15 cents a thousand, depending a great deal upon the clay.

Mr. Perkiewicz has had the process in use in Europe for a number of years with perfect results and is at present making arrangements for a practical test on a mud brick plant in the vicinity of St. Louis. If the process can be adapted to our American clays, it will be of great value to our mud brick makers as the first cost of installment is small and the process is intermittent, that is, it can be cut out in an instant and applied again at any time, which enables the brickmaker to treat his brick for any length of time, subservient to conditions of dry house and kilns.

One of the most complete clay products exhibits can be found in the Kentucky State Exhibit in Block 62, Mines building. The enclosure on one side consists of face, building, fire and paving brick, drain tiles, sewer pipe, wall coping, flue linings, hollow building blocks, terra-cotta vases and architectural terra-cotta in various colors. This exhibit is very comprehensive, considering the space it occupies.

There are also shown four pieces of hand-turned vitrified sewer pipe made in 1850, which when compared with the modern sewer pipe will show what wonderful strides and progress have been made in the sewer pipe industry.

The C. W. Raymond Company, of Dayton, Ohio, has made a very creditable exhibit at the World's Fair of various products of their machinery, collected from all quarters of the Globe. They do not exhibit machinery, nor do they enter for competition, but their exhibit is nevertheless interesting and worthy of study by clayworkers attending the Fair. The display can be found in the Mines and Metallurgy building, in charge of Charles W. Raymond, Jr. It is needless to say that a cordial welcome awaits all visiting clayworkers.

The C. W. Raymond Company's Exhibit in the Mines Building.

NOTABLE POTTERY EXHIBITS.

The Royal Porcelain Factory of Berlin, Germany, shows four art panels carried out in sombre colors without any garish effect of brilliant coloring, at the same time having the general effect of great antiquity, apparently owing to the peculiar glaze employed.

They also show an elegant frieze in figures, consisting of dancing girls in white, all in different positions, on a yellow backing (background?)

The detail contour of the figures are truly wonderful and shows the possibilities of making clay products in artistic lines for architectural purposes of which the layman can hardly have a correct conception.

The exhibit of the Grueby Pottery, in which they show some beautiful interiors and art pottery ware, all having the true "Grueby" finish, which lies between the extreme brilliancy of high glazes and the quiet uniformity of the matt finish.

As to Delft ware the popular belief that it only exists in blue and white is combatted by the exhibit of "Holland."

The original Delft ware was polychrome in coloring, but was changed to a pale blue and white with a constantly decreasing demand so that of the 26 that existed in 1800 only one remained in 1876. From that time on the coloring drifted into darker shades of blue. The exhibits show some beautiful specimens of modern ware.

In the Varied Industries Building can be found quite a number of very interesting exhibits, among them being:

The piece par excellence of the American Encaustic Tiling Company consists of a mosaic art panel, entitled, "Cupids Holding a Crest," in the most gorgeous color schemes owing to the almost limitless range of the colors that the firm produces.

A big lump of fireclay, that stands up under the indicated heat of Cone 36, can be seen at the exhibit of the Louisville Fire Brick Company. Just think of it, a temperature of 3362 degrees Fahrenheit, a temperature almost twice as high as that which some of the paving bricks are burned at.

The Gates Potteries have an exhibit of their "Teco art pottery." Their line of pottery stands in a superior class by itself owing to its chasteness of design and harmony of decoration. Its elegant velvety glossless finish with its delicate shadings and the richness of its tones appeals to all lovers of the beautiful. Its peculiar characteristics have won for it an enviable place among the world's art wares and its front rank has an assured future.

A mammoth $2,000 vase in the exhibit of the Weller Pottery Company, in the mining gulch, was shattered by the force of the storm that visited the World's Fair grounds recently. This vase probably was the largest ever manufactured of clay, standing eleven feet high and being four feet in diameter. It was made especially for exhibition at the World's Fair, and was one of the features of the pottery exhibit. The vase stood in the display room, near a window that worked on a pivot at the center. The force of the wind broke the fastening, and the vase was blown from its pedestal.

A FINE DISPLAY OF CARS.

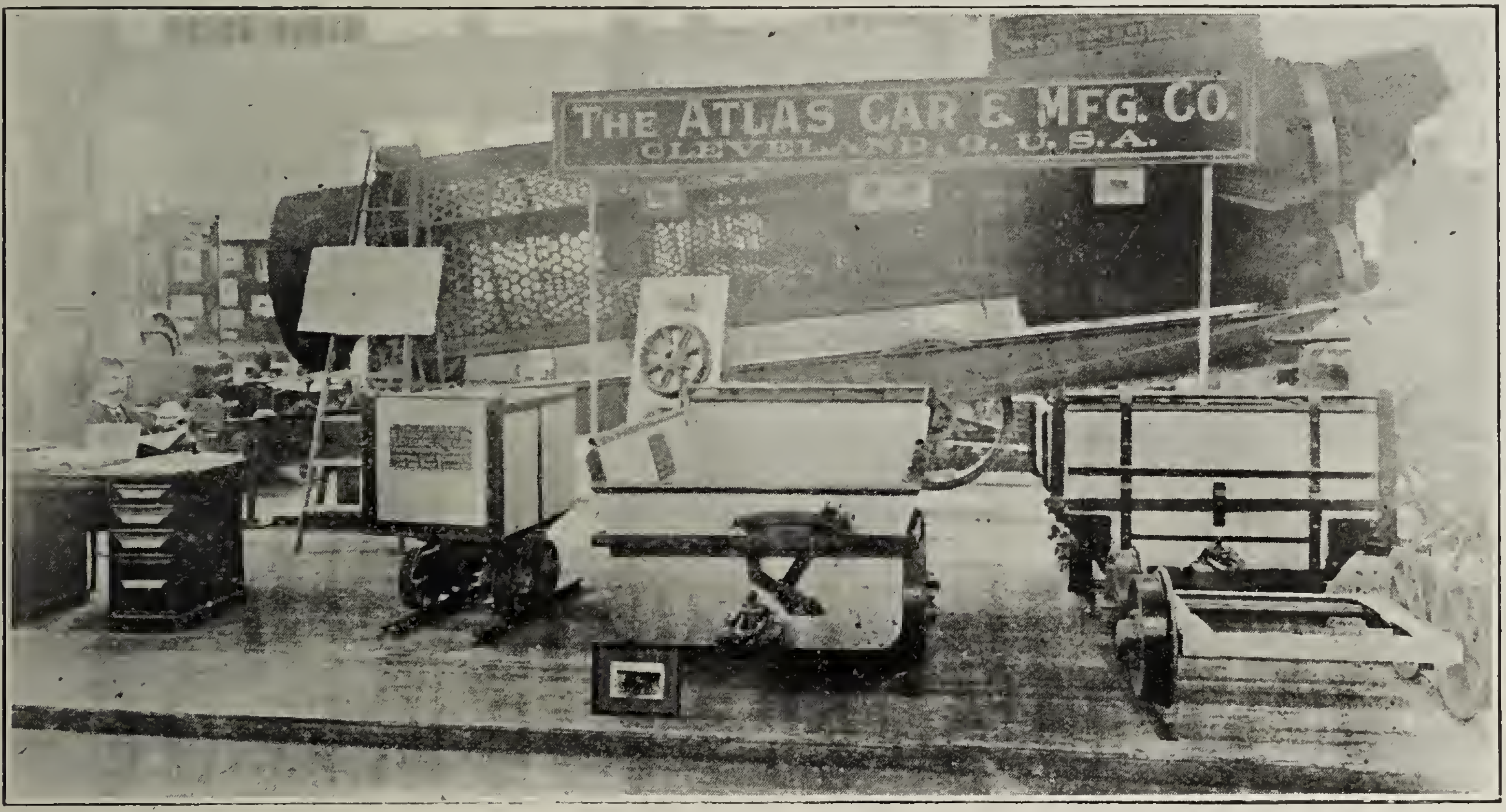
The Atlas Car and Manufacturing Company, Cleveland, Ohio, whose name seems so inseparably associated with brickmaking, as well as most other kinds of work, where haulage plays an important part, has a fine exhibit in the Palace of Mines and Metallurgy at the St. Louis World's Fair.

Entering the Palace of Mines and Metallurgy at the north end and turning to the right of the last aisle but one—Aisle G—we go south to nearly half way of the building and in Block 73 we find the Atlas Company's exhibit, just before we get to the colossal iron statue of "Vulcan" exhibited by the state of Alabama. There is no difficulty in finding the Atlas company's installation and still less difficulty in recognizing it when it is reached.

The space occupied by the Atlas Car and Manufacturing Company is an extensive one, but it is not crowded, the consequence is that what is on the stand is shown to the best advantage. Three cars are exhibited. These are three representative types, but they stand for only a small part of the company's manufactures. One of the cars has a capacity of thirty-six cubic feet and can be provided with a draw bar for hauling in a regular train on a steam road.

The several features which have given the Atlas cars such a prominent position in the brickmaking art are well explained by the company's representative. One of the many valuable features is the self-oiling car wheel. The great economy of lubricant is smallest among the advantages, the chief of which is that the bearing is always oiled just as much as it needs to be, this is done automatically, every part is shut down tightly so that dust and grit are effectually kept out of the bearing. As the oil in the reservoir does not have to be renewed frequently there is a saving, not only of lubricant, but of the oiler's time and attention and though his time may not be worth a large sum his care and attention would, in many cases, not be so plentiful.

The perfection shown in the general construction and design of the Atlas cars is the result of many years of experience gained from their use in so many brick plants of this country, as well as several others.



World's Fair Exhibit of the Atlas Car and Manufacturing Company, Mr. S. D. Wright in Charge.

If you are looking for cheap machinery, scan THE CLAY-WORKER'S "For Sale" ads.

Written for THE CLAY-WORKER.

CLAYS AND CLAY PRODUCTS IN THE PALACE OF MINES AND METALLURGY, ST. LOUIS EXPOSITION.

IT IS NOT EXPECTED that these articles will fully describe the exhibits of clay ware within this building, but rather will take up each State and endeavor to give as nearly as possible a summary of what these exhibits contain, of interest to clayworkers. It is not the intention of the management, judging from a glance at the classification of exhibits, that this building should contain much, outside of the General Clay Industries section, in manufactured clay, but that clays should be shown and an example of each should be shown with the clays. Superintendents found, however, in some cases that they had to depend to some extent on their clay industries to help them out in decoration and beauty of installation and some went quite extensively into the exhibit of manufactured clay ware.

Much more could have been done than has been but for all that the display is one of considerable interest and by patience and a little digging the clayworker will feel rewarded for his hunt.

ALABAMA.

Alabama shows but two samples of clay product, each good, and they are shown so clayworkers may see as they pass under the great Vulcan statue. These samples are paving brick from the Graves Brick Company., Graves Mines and from the Southern Pipe Company of Birmingham, sewer pipe and connections.

ARKANSAS.

Arkansas does not go very heavily into clay display, showing two samples of shale and brick made from same by both the Choctaw Press Brick and Terra Cotta Company, and J. D. Carbough. Potters clay is shown by C. D. Heyton of Benton.

CALIFORNIA.

This State has an interesting display and the superintendent, Mr. L. D. Sovereign, will be pleased to please any clayworker who does not see all there is in the display, by telling him about it in a very intelligent manner. This display consists of some twenty varieties of clays, shale and kaolin, terra cotta, glazed tiling, enamel brick, pressed brick and fire brick. The brick and terra cotta is shown to good advantage in the top of entrance arch. Firms showing are Los Angeles Pressed Brick Company, Pacific Art Tile Company, Tropico, Gladding, McBean Company, and N. Clark & Sons of San Francisco. An interesting brick is shown, made from beach sand under very great pressure, but with no binder. This is a firm, hard brick, apparently as strong as the ordinary sand-lime brick.

COLORADO.

One would not go into the establishment of Tiffany & Co., of New York, looking for samples of brick and the ordinary brickmaker would be apt to give Colorado's booth a wide berth, if looking for clayware alone. The fact of the matter is though that there is quite a showing of clayware and it is done with entire credit to clayware in the fact that there is no injury to the jeweled effect of this remarkably well installed exhibit. This clay display consists chiefly of refractory clays and pottery clay. Some fine examples of pottery are shown in one case, from the works of the Van Briggle Pottery Company, Colorado Springs. Case No. 2 contains samples of fire and potters' clay and samples of presed brick, fire brick and ornamental brick, all in attractive shades. Exhibitors are the Golden Press and Fire Brick Company, Golden; Pikes Peak Brick Company, Colorado Springs; Cresta Clay Company, Boulder. Case No. 3 contains fire clays and refractories from the works of the Denver Fire Brick Company. Examples are Metallurgical tiles, retorts and tiles.

An Interesting Demonstration of the Effect of the Perkiewicz System for the Prevention of Scum on Brick During the Process of Burning.

Brick Column and Terra Cotta Finial at Entrance of Pennsylvania's State Exhibit.

Exhibit of Roseville Pottery, in Charge of Mr. G. W. Parker, Who Deftly "Turns" Small Pieces on the Wheel to the Delight of Many Visitors.

GEORGIA.

This State shows no clays in their State section, but has a State exhibit in the general clay section of Clay Industries Exhibit.

IDAHO.

Simply shows raw kaolin.

ILLINOIS.

To say that a State ranking fourth in the manufacture of clay products could be thoroughly represented in the small space usually alloted to a State in the Mines Department at this Exposition, would be equivalent to a statement that a bushel could be contained within a peck.

Illinois is, however, fairly well represented as a clay state in its general display, but one would have to look for the figures to appreciate the fact that her yearly output has nearly reached the value of $10,000,000.

One naturally looks for the showing of the Purington Company, when looking for Illinois clay products. This company has made quite a display in the general clay industries, but show in the Illinois space, samples of their rock face, continentals and paving brick.

The Northwestern Terra Cotta Company, of Chicago, another extensive exhibitor in the general clay industries section, show some fine samples of their terra cotta and the raw and calcined clays from which it is manufactured. The Argillo Works of Carbon Cliff, show their fire clays and examples of stiff mud flash brick. Mamer Bros., of Campus, show side cut face brick and clays from which they are made. Chas. F. Hicks, of Drake, shows a specimen of red shale clay and light shale. Selly & Sons, of Danville, show their shales and examples in the shape of face and paving brick. Potters' clay is shown by the Shelton Pottery Company, of Metropolis. The Springfield Paving Brick Company exhibit their shale and paving brick made therefrom. A large double T sewer pipe is shown as the product of the Stoneware Pipe Company of East Alton. End cut hollow brick and common brick are shown by E. T. Townsley of Aledo. The Wier Pottery Company, of Monmouth, show examples of their most excellent stone ware in the shape of jugs and fruit jars. Of unusual interest are the samples of potters clay and kaolin from the clay banks of Goodman & Karraker, of Cobden. These samples are unusually well prepared and are interesting aside from this, in their remarkable coloring. These specimens are not unlike onyx in apearance. This company confines itself to the shipment of clays to the potters' trade. The Barr Clay Company and the Streator Paving Brick Company, of Streator, both show samples of shale and the product of their factories.

In this exhibit is also shown Amorphous Silica from Jonesboro, samples being furnished by Grieb & Drexler, Southern Illinois Manufacturing Company, and J. P. Bausher.

This exhibit is now in charge of Mr. Walter H. Jackson, of Vienna, Illinois.

IOWA.

Though producing no pottery or any of the finer class of clay ware, with the exception of face brick, Iowa ranks well in the clay industry, with a yearly value of output of $2,843,591. She has made two general exhibits of clay wares, the one in the Mines Building and one in the Manufacturers' Building which we will describe later. The exhibit from Iowa in the Mines Building consists chiefly in clays and individual samples, at this time, but they are installing pressed brick panels and will show some diversified product, consisting of hollow building blocks, electric conduits, sewer pipe, drain tile and stone ware.

The companies exhibiting are F. Berninghausen, of Eldora, Davenport Paving Brick and Tile Company; Bradshaw Brick and

Tile Company, Lake City; Corey Pressed Brick Company, Lehigh; Des Moines Clay Manufacturing Company; Fort Dodge Brick and Tile Works; Fort Dodge Pottery Company; F. W. Heidenrich, Iowa Falls; C. J. Holman & Bro., Sargents Bluffs; James Mahnes & Son, Des Moines; Iowa Pipe and Tile Company, Des Moines; Red Oak Pottery Company, Red Oak; Platt Pressed and Fire Brick Company, Van Meter; E. J. Smith & Son, North English; M. F. Trabert, Prescott; Boone Brick, Tile and Paving Company, Boone; Mason City Brick and Tile Company, Mason City; Getham Pressed Brick Company, Gladbrook; Granite Brick Company, Clinton (sand-lime brick).

The railing of this exhibit is constructed of Platt, Van Meter, red pressed brick and Corey, Lehigh buff pressed brick.

The exhibit is in charge of C. B. Platt, of Van Meter, Ia.

KANSAS.

Kansas is fast developing into a clay state, owing to her fine beds of shale and the availability of gas as a fuel. It is an item of interest in her display to note the difference in the brick burned by gas and those burned by coal. The samples shown are so arranged to show this nicely. A fine brick mantel and fireplace is shown, contributed by the Coffeyville Vitrified Brick and Tile Company. The exhibit contains samples of clays and shales and finished product, consisting of side and end-cut brick, pressed brick and tile. Exhibitors are, Columbus Vitrified Brick and Tile Company; Union Brick Company, Iola; Capital City Vitrified Brick and Paving Company, Topeka; Lawrence Vitrified Brick and Pipe Company; Ottawa Brick and Tile Company; Clay Center Brick Company; Salina Vitrified Brick Company; Atchison Paving Brick Company; Fort Scott Brick Company. These all use coal in burning. The companies exhibiting gas fired ware are: LaHarpe Shale Brick Company; Coffeyville Vitrified Brick and Tile Company, four plants; Caney Brick Company; the Fredonia Brick Company; Pittsburg Vitrified Building Brick Company, Sycamore; Cherryvale Brick Company; Federal Betterment Company, Cherryvale.

KENTUCKY.

In Kentucky the clayworker will find much of interest and will see perhaps the most diversified product shown in the Mines Building, outside of the general clay industries exhibit. The railing around the space, on one side is constructed entirely of Kentucky clay products and consists of pressed brick, hollow block and wall coping, ornaments, urns. The entrance is a fine arch constructed of red and buff terra cotta, surmounted with a fine gray urn. This work was done by the Waco Brick Manufacturing Company, of Waco. Material in the rail was furnished by P. Bannon & Co., of Louisville. In the sewer pipe exhibit is shown a pipe six feet in length, made by the Owensboro Sewer Pipe Works. The celebrated fire clays, potters clays and buff and red clays are shown, with examples of their product, in six cases with reference to the section of the State from which the clays come. Case No. 1 contains clays from the southwestern section of the State. No. 2, kaolins, fire clays, etc. Case No. 3, Prysburg kaolin clay, showing tile in the three stages; Carlysle Co. buff clays and fire clays. Case No. 4, examples of pottery experimental of clays shipped in for this exhibit from the undeveloped field. This is of especial interest to investors. Case No. 5, Mayfield Brick Company, Mayfield, white clays and samples of grey pressed brick made from same; Newport Pressed Brick Company, red pressed brick. A tile is exhibited in this case made from clays taken from the farm on which President Frances of the Exposition Company was born and reared. This has upon it a relief head of President Lincoln.

Case No. 6, clays from the northeast section, Ashland Fire Brick Company, Ashland, fire brick, flint and plastic clays. This is the celebrated Carter County clay. Brick made from this clay are used extensively in the Pittsburg and Birmingham furnaces. Case No. 7, Tygart Fire brick Company, Fullerton, showing flint and plastic clays and product; Louisville Fire Brick Company, works in Carter county, fire brick, fire and potters' clay. The Waco Company show some interesting specimens of tile which they made in [illegible]. They are jointed drain tile of about four inches in diameter and were turned by hand, the finger-marks showing plainly on the outside. This exhibit is in charge of Mr. W. U. Grider, who extends Southern hospitality to interested visitors.

MARYLAND.

The Maryland exhibit is one of more than ordinary completeness in clays and their product. A wide variety of clays are shown in glass jars, and in the sixty varieties shown are found common clays, shales, potters' clays, fire clays and kaolin. The principal exhibits of manufactured material, which as a whole pretty nearly covers the clayworking field, are: A fine large fireplace of flashed Roman brick, by the Washington Hydraulic Pressed Brick Company; Edwin Bennett's Roofing Tile Works, glazed and unglazed tiles. A very attractive case of fine decorated pottery is shown as the product of the Edwin Bennett Pottery Company and D. F. Hayes & Son; large ornamental terra cotta tiles by Baltimore Brick Company and the Burns, Russell Company of Baltimore; refractories and retorts by the Baltimore Retort and Fire Brick Company and Mt. Savage Fire Brick Company. This exhibit is in charge of Mr. E. H. Sapp.

MINNESOTA.

Minnesota makes no particular exhibit, but simply shows a few pressed brick from the factory of the Twin City Pressed Brick Company, of St. Paul, in the brick and stone facade. Michigan makes no showing of clays except as used in making cement. New Jersey has, like Ohio, made an extensive State exhibit within the space of the Clay Industries Section, and makes no showing in the State space. Ohio shows cement clays. New York has a small space devoted to manufactured product and shows a pagoda of brick of all kinds and varieties, covered by a tile roof, the tiles coming from the works of the Celadon Roofing Company, Alfred, N. Y. The New York State School of Clayworking shows a large vase turned by F. E. Walrath.

Entrance to the Kentucky Exhibit in Mines Building.

MISSOURI.

Missouri has a remarkable clay field, and its products are shown largely at the exposition. The State, in its mineral exhibit, confines itself to the showing of clays in various conditions of preparation, showing chiefly fire clays and kaolins. So much having been done by individuals in the Clayworking Industries Section, in this department, and in the Gulch, manufactured products are shown by the State in one fine example—a brick and terra cotta pagoda. The terra cotta was furnished by the Winkle Terra Cotta Company; the pressed brick by the Hydraulic Pressed Brick Company, and the roofing tile by the

Mound City Tile Roofing Company, all of St. Louis. This exhibit is in charge of Mr. Ray F. Rucker.

NORTH CAROLINA.

In North Carolina we find the chief interest to clayworkers lies in the showing of kaolins, in which the State appears to be rich.

Some very fine specimens of decorated pottery made from this kaolin at the Ohio potteries of Knowles, Taylor & Knowles and some of a plainer variety from local potteries is shown. Here are also samples of artistic tiling from the American Encaustic Tiling Company, of Zanesville, Ohio, and pure white tiling from the National Tile Company, of Anderson, Ind.

Examples of enameled brick are shown made from this kaolin by Sayre & Fisher, of New Jersey. Pressed brick are not extensively shown, but there are a few samples of good gray brick made by the Hydraulic White Brick Company, of Wilmington, N. C. Numerous samples of common brick are shown and some sewer pipe, drain tile and hollow block from the works of the Pamona (N. C.) Terra Cotta Works.

The following is shown from an analysis of North Carolina kaolin:

Clay substance	83.39
Quartz	14.98
Feldspar	1.58

The North Carolina exhibit is in charge of Mr. F. B. Laney, Assistant Geologist North Carolina Survey.

NORTH DAKOTA.

North Dakota has made a specil effort in the clay line, and shows some very fine samples of potters' and fire clays. They have no factories for working the potters' clays, but have gone to a great expense to have a wide variety of decorated pottery made, all of which is artistically shown.

Tennessee shows some fine specimens of clay, but no particular exhibit of manufactured stuff. Texas has a very complete showing of the clays of the State. Their exhibit is well grouped and each clay has a copy of analyses and a sample of ware shown with it. In this respect this display is superior. The display is interesting in its variety.

PENNSYLVANIA.

When one contemplates a yearly mineral production of $554,281,373, it would seem that a clay exhibit in a general display would not loom up very great. It is, however, a hard matter to lose a display from a field whose yearly product is $17,833,425, and it can be said that Pennsylvania clayworkers need not to be ashamed of their clay exhibit.

It may appear to be somewhat crowded, but it is well shown after all and is well grouped and shown in processes. The raw material display may be safely counted the best in the building. Fire clays are chief in interest. These specimens are from Harbison & Walker, Pittsburg; Woodland Fire Brick Company; Clearfield Fire Brick Company; Cambria Fire Brick Company, Figert; Welch, Gloniger & Maxwell, Pittsburg; Queens Run Fire Brick Company, Lock Haven; Frederick Monro & Co., Farrandsville; Elmer E. Melick, Retort; Dixon, Woods Company, Pittsburg; Westmoreland Fire Brick Company, Pittsburg; Joseph Sisson & Sons, Connelsville. These exhibits consist of raw and calcined plastic and flint clays and their products. The Eureka Fire Brick Works display a small coke oven made at their plant in Mt. Braddock. A case of paint clays. of great variety in color is shown. Under head of Tile Clays and Products, a case containing raw and calcined clays, and fine examples of vitrified and semi-vitrified encaustic tile is in evidence. The company showing same is the Star Encaustic Tile Company, of Pittsburg. In an adjoining case, under the head of Enameled Wall and Vitreous Tile, glazed, embossed and enameled tile are shown. Company showing same is Art Tile Company, Beaver Falls. The adjoining case is filled with the product of the Mayer Pottery Company, Limited, Beaver Falls, and shows a complete line of colors in which glazing is done, decorated china, clays, cones and saggers. This exhibit is more than interesting, as one can follow the journey of a plate in its decorated pathway from pure white to glorious color. The north entrance of the space is constructed of Kitanning white brick and Conkling-Armstrong terra-cotta. A case filled with pressed brick is also of interest.

WASHINGTON.

Washington shows a good display of clays and manufactured material from the works of the Washington Brick, Lime and Manufacturing Company, Spokane. In the space of Oklahoma, Nebraska and Louisiana, several specimens of brick and clay may be seen. Idaho, Mississippi and Virginia, in the southeast section of the building, have small exhibits of clay. Mississippi shows some good pottery and quite a number of clay samples.

FOREIGN.

There has been very little attempt to make a clay display in any of the foreign section of the Mines and Metallurgy Building. Germany shows some samples of refractory clays of high grade and specimens of graphited fire brick. England devotes a part of one case to fire clays, common brick and terra cotta clays, specimens of terra cotta floor tile and fire brick. Economy of shipping space was sought, and these samples are interesting from the fact that they show a great deal in a little space.

THE PRESS THAT SCOTT BUILDS.

One of the noticeable features of the Clay Industries Exhibit at The World's Fair is the amount of attraction that the working model of the Andrus Press draws for the Scott Manufacturing Company exhibit. This little model of the "Press That Scott Builds" attracts the attention of every visitor. To be convinced of this fact, one has but to visit with their representative, Mr. McAnulty, for about fifteen minutes and he will see that he has very little time for conversation, since almost every passing visitor stops to make some inquiry about the press, many not knowing it from a sewing machine, but a great many more being interested because of some relative, uncle, or cousin, who has a brickyard in a town either adjacent to St. Louis, or perhaps in some far away state.

THE ANDRUS IMPROVED BRICK PRESS
"THE PRESS THAT SCOTT BUILDS"
SCOTT MANUFACTURING CO
KEOKUK, IOWA.
J. A. McANULTY, SALES MANAGER.

The Exhibit of the Scott Manufacturing Company. Mr. W. F. Scott, the Man behind the Press.

This last month has proven conclusively to the officials of the machinery departments the fact that almost every person is more or less interested in machinery in operation. No machine that is working, or that is in actual operation, whether in the Mines and Metallurgy Building, Machinery Hall, or Varied Industries, is without a group of spectators and most of them intensely interested in it.

Mr. McAnulty has made it a point to be at the exhibit most all of the time and is taking that much interest in the brick machinery world that he has about decided to act as Western representative for "The Press That Scott Builds," making his headquarters in San Francisco and working all western territory as far east as Denver.

At our next World's Fair, we are going to hope that a number of presses will be in actual full-sized operation, and if the press that "makes brick every day" is there, some one will have to start a kiln just outside the building to demonstrate the burning of brick, in order to take care of the "green" output of the "Scott Noiseless Plant."

DISPLAY OF CERAMIC SUPPLIES.

An exhibit that will be of particular interest to ceramic chemists or clayworkers using glazes and various coloring materials, is that of the Roessler-Hasslacher Chemical Co., of New York, which is located in Block 66 in the Palace of Liberal Arts. Some choice specimens of art pottery are displayed and also a line of porcelain, china, glass ware, etc., which was decorated with Roessler-Hasslacher products, which includes everything needed in the production of ceramics.

Written for THE CLAY-WORKER.

AMONG THE POTTERS.

The POTTERIES in this vicinity have been rather slack here of late, but business has shown an improvement in the last week, and they expect to have a very fair year. What business they are getting is reported to be very desirable business, and although some of the plants have not been running fully since July and some of them are still very slack, still a good fall trade is looked for with the majority of the potteries and with some of them has commenced already.

The Knowles, Taylor, Knowles Company have had a part of their factory shut down for the past two weeks on account of an overstock, but expect to start up again some time this month.

The Homer Laughlin China Company, of this city, is hard at work upon the new four-story warehouse which they are erecting at their No. 3 plant and also upon an addition to their national or No. 1 plant. These new additions will greatly facilitate matters in these two departments.

The Harker Pottery Company, of this city, is just completing a new three-story warehouse and decorating department, which they expect to occupy within the next month. They are also completing the erection of a couple of new decorating kilns.

Mountford & Sons, operating the Eagle Stilt and Pin Works. and making stilts and pins for pottery use, are making some new installations in the way of slip house machinery at their plant in this city.

The plans have been completed for the new National Electric Porcelain Company, which will be erected in this city shortly. The new plant will have a capacity of four kilns but will be arranged so that they may be increased to six at any time. The company has not as yet purchased a site, but will do so shortly, as they have several in view, all of which are very desirable. The plant will, it is said, be erected immediately and may be in operation by January 1st. G. P. Ikert is president, G. S. Thompson, treasurer, and P. V. Mackall, secretary.

The Riverside Knob Works, of this city, has just completed the erection of another new kiln, which they expect to have in operation within the next week.

The East End Brick Works Company, of this city, has started to fire their kilns with gas in place of coal, and are getting very gratifying results from the use of the same. This leaves but one or two concerns in this city using coal for fuel—the American Sewer Pipe Company and the Burford Brothers Pottery Company.

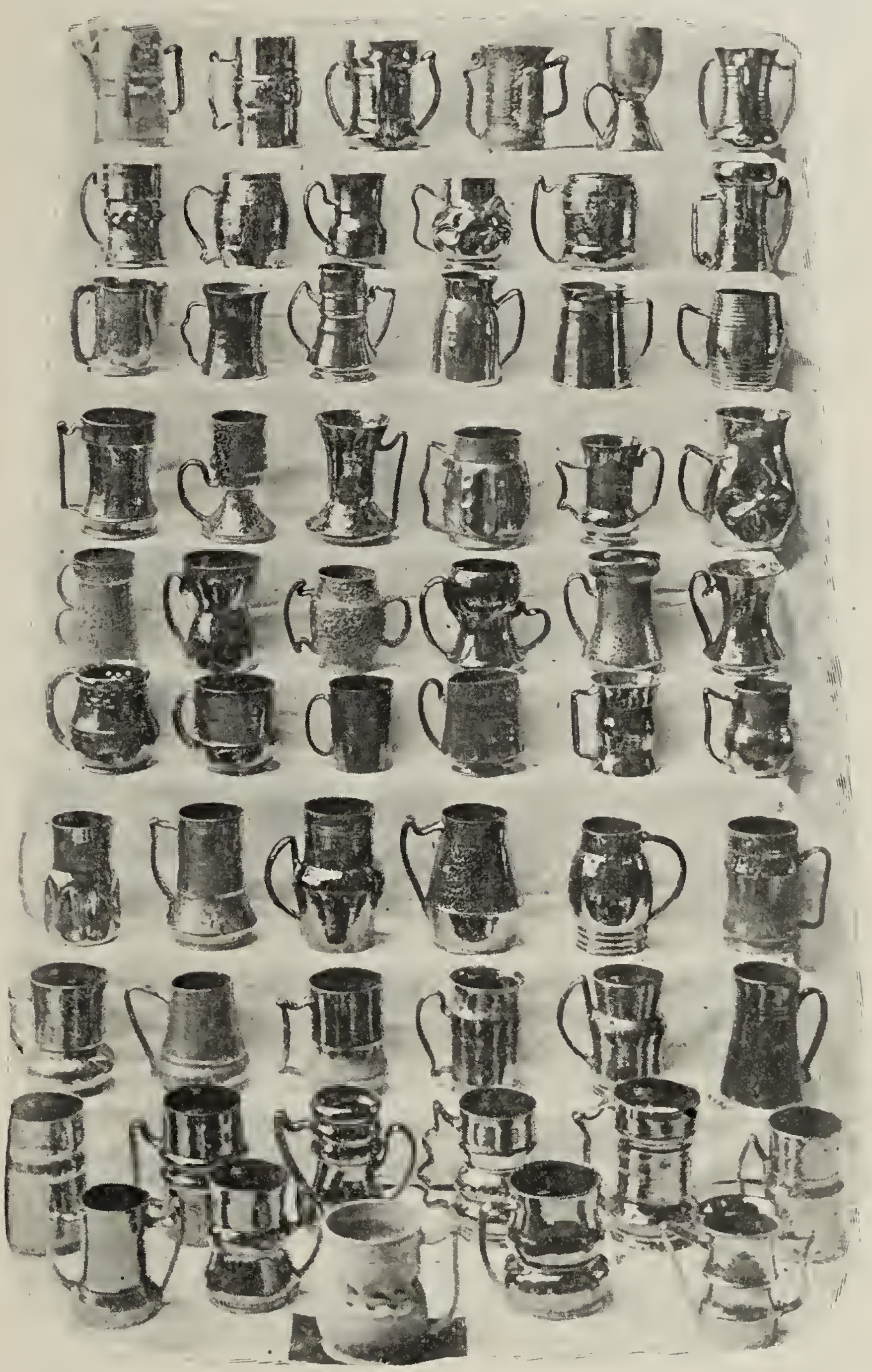
The Akron China Company of Akron, O., is installing some new machinery in their clay room of their pottery at East Akron.

The new plant of the Lima Insulator Manufacturing Company, of Lima, N. Y., is progressing finely. They have their buildings almost completed and will start work upon their kilns within the next week. The machinery is now being installed in their works and they expect to have the new plant in complete operation by the 1st of October. W. D. Newton is president of the company and M. H. Burke, secretary and treasurer.

The Mosaic Tile Company, of Zanesville, Ohio, is already occupying some of the new additions to their plant there and expect to be ready to move into the others within the next two weeks.

The Cameron Pottery Company, of Cameron, W. Va., which is in the hands of a receiver has resumed operations and will, in all probability run steadily, at least until the holidays.

The Novelty Pottery Company, of Crooksville, Ohio, has changed the name of their company to the Crooksville Pottery Company. They operate a two-kiln stoneware plant and are running right along.



Specimens of "No-Two-Pieces-Alike" Pottery Made by George E. Ohr, Biloxi, Miss.

The Universal Sanitary Manufacturing Company, of New Castle, Pa., which was closed down for a few weeks has resumed operations and is now running along steadily.

The Shenango Pottery Company's cask-making department was destroyed by fire some weeks ago entailing a loss of over $2,000,00.

The National Pottery Company, of Evansville, Ind., experienced a strike at their pottery there two weeks ago over some trouble regarding the number of apprentices they had at work in their factory. The trouble was amicably settled.

The plans are about completed for the new seven-kiln pottery plant to be erected immediately by the Union Potteries Company, of Pittsburg, Pa., at Huntington, W. Va. The plant will be a mammoth affair and the officials of the company expect to have same completed and in full operation yet this year. Mr. F. W. Fowler is president of the company.

The new works of the Syracuse China Company, of Syracuse, N. Y., are progressing finely. They have their kilns almost completed and also have the brick work of their buildings almost completed. The machinery is also being installed and the plant in all is progressing very favorably. About all that remains to be done on the buildings is some carpenter work, when they will be completed. The company expects to have their plant in complete operation within the next sixty days. They are now at work upon their molds.

After a satisfactory settlement of some differences between themselves and the concern, the kilnmen at the works of the Keystone Pottery Company of New Brighton, Pa., have returned to their work.

The Cameron Pottery Company, of Cameron, W. Va., has been re-organized and the former officers replaced by the following: W. B. Hicks, president, C. E. Hutchison, vice-president, Warren Wilson, secretary and treasurer. C. W. Dawson, E. Cooley, Alex. Hall, Warren Wilson, E. W. Boerner, J. A. Hicks, C. E. Hutchison, W. B. Hicks, J. N. Howard were chosen as directors. TOM POTTER.

East Liverpool, O., Sept. 8, 1904.

Written for THE CLAY-WORKER.

CAPITAL BRICK AND BUILDING NEWS.

THE DULL PERIOD in brickmaking and building which usually occurs every summer in the District of Columbia—when the "captains of industry" get hung up in the tropic doldrums of business—has passed and things are looking up wonderfully—plenty of work and great demand for brick. So the brick men are smiling. One of these is a new addition to the "captains" in this interest, coming here last April and taking control of the Potomac Brick Company. This gentleman is Mr. Elliott S. Morse, formerly with the Merwin Brick Company, Berwin, Conn.

Mr. Morse succeeded E. R. Diggs as manager of the Potomac Company, and is evidently making a success of his work. Like other brickmakers here, he is looking for continued activity in the brickmaking business through the fall and a big "spring-up" in the spring. Of course the "spring-up" will not have anything to do with the wagons that will haul the brick from factories outside of Washington when mud-time comes; for the hauling question has not been settled—that is, no substitute for the mule has yet been found. If a convenient means of getting brick into this city could be devised there would be much more money in the brick business.

There will always be a demand for good brick here, and for the next few years the demand will be extensive. The continued rapid growth of the city is a matter of wonder to most people. Some few years ago it seemed that there was danger of overbuilding here, but since then thousands of houses have been built, and, at present, rents are high. There were added last year forty apartment houses to the large number already built, and still these places of residence are well filled, easily bringing in $10 per room per month. If one owns an apartment house with from 100 to 300 rooms—and there are many such—it is easy to see how a red automobile and a flunkey can be "sported" on the income from rents.

I am glad that bricks are so extensively used in these huge structures, not only for the profit of the brickmaker and bricklayer, but because the clay product is the best safeguard against fire, and the after-effects of fire-crumbling walls.

Recently the value of brick in the particulars mentioned has found a most able advocate in Colonel John S. Sewall, U. S. engineer in charge of the new War College and Engineers' School being constructed in Washington. Colonel Sewall has given much attention to fire-tests on brick and other material and speaks on this subject with authority. He says that a fireproof building should be so constructed that it will stand in any fire, not only protecting its own contents (when the fire is outside) from ignition, but should act as a barrier against the spread of the conflagration. If the fire should start within the building, the qualities of the structure should be sufficient to keep it confined to the inclosure of its beginning. In any case, the parts of the building exposed to the fire should not suffer damage, except in the matter of finishings, and these should not constitute a large percentage of the cost of the building. Colonel Sewall states further that the only material that fulfills all the requirements of fire protection is good brickwork with cement binding. He says that no building of stone of any kind is fireproof and that the amount of stone used should be as small as possible and should not, in any case, be used for walls above the second story. Colonel Sewall thinks that Portland cement is suitable for building walls, as far as fire resistance goes, but not as much so as brick. He is of the opinion that, in order to secure the proper protection of openings all windows should be glazed with wired glass and have frames of cast-iron or stiffened sheet metal. The external openings of buildings should also have some means of being absolutely closed. Whether the tin-covered wooden shutters are adequate seems open to debate, he states, but it would seem that a good form of shutter would be a steel plate about three-sixteenths of an inch thick, stiffened around the edges and hung like a sash.

Investigation of hollow tile after they had been subjected to severe heat proved that the tile in general use are not perfect protectors. In most cases they protected the steel framing of the burned structure, but were rendered practically useless themselves. This, it is stated, was not the fault of the material, but of its form. The webs were too thin.

Referring again to brick and building business in Washington it may be said that there is one brickmaker here who is doing "double duty" for the city. This is Mr. John Miller, who not only provides large quantities of brick for government and civilian building enterprises, but is contributing to the city's growth with his own buildings. Mr. Miller is having quite a number of buildings erected, and is particularly improving a portion of the city, in the southwest, that has been long neglected.

One of the considerable enterprises in brickwork here is the Virginia-avenue tunnel, which is being built to handle the freight of the Philadelphia, Baltimore & Washington Railroad, in connection with the new ralway terminals, and for the abolishment of grade crossings in the city. The tunnel is intended for a double-track inclosure, is about 2,800 feet long, and is composed of a brick arch with a stone side base. The arch is being built in sections thirty feet long laid on movable centers having seven heavier trussed transverse ribs connected by four-inch lagging.

The brickwork is being done by several gangs of men who work in three separate sections so as to facilitate progress and to complete portions of the arch that cross streets.

Five hundred men are employed on this work, and there is a great deal of machinery used. The source of the power employed is a compressed air plant of considerable dimensions, located near the tunnel. NICODEMUS.

A Fine Catalogue of Tempered Clay Brick Machinery.

C. & A. POTTS & CO., Indianapolis, Ind., have out a new catalogue devoted to their specialty, soft clay machinery. It is a handsome 60-page book. The cover design is very "fetching," being a heavy dark grey paper on which the title is printed in bright gold, which, with the ornamental features are grouped about an etching of an old-time brickyard scene—a molder making a brick by hand. The book contains many fine illustrations of Potts' machinery, which includes everything about a soft mud brick plant, including vertical and horizontal stock brick machines, clay disintegrators, mold sanders, pug mills, granulators and feeders, all styles of dump cars, brick trucks, barrows, kiln irons, etc. They will be pleased to send a copy to any reader of the Clay-Worker who has not already received one.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

THE SHIP BRICK is gradually drifting toward the strike reefs, not that they are unknown to those in command, because they have been chartered as long back as the labor of man became a matter of necessity. There are a number and variety of reefs which have made their appearance in the last twenty years, in regard to which the older captains of the good ship have no need to consult their charts. Many a good ship has been sailing along, when, without any warning of the hidden danger which lurks below the surface, she has been wrecked. The ship Brick has escaped so far, but is in danger. The reefs of dissatisfaction now call for the best ability of the navigator to avoid a wreck. Once more, and within a year the captains are called upon to take the wheel and show those who would wreck the ship that they can safely bring the good old craft into harbor.

TROUBLED WATERS

Have been in sight for years, some years but slightly ruffled, others nearly gale proportions. The year 1903 reached hurricane proportions. That the seas did not dismast, if not completely make a wreck, was because those in command were competent navigators.

The strain on the ship was very severe, the hull was strained to the utmost and she proved that her rating was not misrepresented. When the harbor was made, and all damages repaired, those in command took a good, long breath and said, "Thank God, that's past."

GOOD GROUND TACKLE

Is what the different class of vessels which comprise this fleet are fitted out with, and they need it, as they do not know at what time they will have to anchor, as a gale of wind is likely to strike some one of the many kinds which are affected and as a result the good ship Brick gets in the storm center, so that she has to get out both anchors, and at times it looks as though they would not hold till the gale let up. After the test of last year, all thought that it would be smooth waters for the voyage of 1904.

Strikes in front, side and rear is the condition that the good ship has to sail in to-day. It seems that those which go to make up the different classes of the building trades will not agree to anything, but want all or nothing. Last summer when the agreement was signed, it was looked upon as a fair settlement, and surely arbitration should be fair for all, but because they do not get all that they ask for, they go out, and that is the condition to-day.

One thing certainly should be done, and that is, to have no half-way this time. Say, that we will carry on our business as we want to, union or non-union, open to all, and make this fight the final one, if the building trade is to be tossed about like a shuttlecock, at the whim of the union, and when not doing that the leaders making demands on the contractors for money, which must be paid if the contractors go on with their work, while others in the same line are being choked off by strike.

THE NEW MOSES

That has made his appearance and is, so he says, going to carry the strike to a final end, that will be in favor of the unions, seems to be in rather rough waters. Twice in one week he has been indicted for extortion by the grand jury, and the last case is very plain, as the check for $4,000 is in the hands of the prosecution. In the light that has been shed on the doings of the walking delegates the year past, certainly the employer should refuse to hand over the control of his business to these unscrupulous walking delegates.

EARLY AUGUST SHIPMENTS

Were taken off the market without much detention and prices worked up without any holding back, as the call was good and there was no reason that demand should fall off. When rates are satisfactory, as at present, the barges will be loaded as quickly as possible, as the boss does not like to have the boat at the dock unless he is short of men. The arrival of the barge seems to cause a tired feeling among the men that no other job on the yard does.

At present the output of the yards is just as large as it can be. The weather has not been very good during the summer. For the past week there has been no rain. As the season of brickmaking has not over six weeks to run, and not that unless the weather remains good.

There is no stacking of brick in New York as yet, and from the outlook probably there will not be many stored for winter. If the present trouble between bosses and men continues, there will be no call of any account as the season gets shorter. If it should last two months that would bring it up to November. There would be but a short time in which to pile many. It might be that during the complete shut down, the dealers would pile out if they would be permitted by the higher powers, but it is not likely, it would be like some of the moves they had made in the past. What benefit would it be for the walking delegate to stop the brick handlers from working, as the brick could not be used until the men went to work, and without them in reserve for use in the winter, when navigation is closed, there would be no work.

The market has been an active one right along. The shipments have not been held back, prices during the summer have advanced moderately, something remarkable, but very beneficial to the manufacturer. There is no doubt, if there is not a complete shut down, there will be an advance in price in the near future, and by close of navigation it will be one dollar per M higher than present rate which is $7.00, $7.25, $7.37½, $7.50 or about $3.00 per M more than a few years back.

A. N. Oldtimer.

Written for The Clay-Worker.

ST. LOUIS BRICK AND BUILDING NEWS.

BUILDING BUSINESS continues to be good, as shown by the number of building permits issued since the first of the month. The business of this month bids fair to equal or surpass that of last month, when the city made a gain of 106 per cent. over the business of the corresponding month of last year. The building of new dwellings and cottages has not been confined to the city, but large numbers of such buildings are being erected in the suburbs. The erection of costly buildings for sale is also showing up well, as a large number of this class of buildings are nearing completion.

The result of all this is that the brick and terra-cotta lines have been doing much better recently than they have at any time this year.

In spite of the increase in building, nearly every brick yard is only running at about one-half their capacity, although there may be some exceptions to this. Enough business, though is being done to keep the yards busy, and all the products turned out are being sold.

Prices of brick have not changed recently and the prospect for any change in the near future is small.

There has been an increase in the demand for unimproved property recently, and this indicates to those interested in building, that before very long a great deal of building will be done, as the majority of those who are buying have building plans and most of the plans are for flats, apartments and residences.

At the termination of the Fair, if not before, building will no doubt be on a boom and will not only be continued during the balance of the year, but next year as well. Money seems to be plentiful for this purpose, and had not workmen been scarce and wages high, and material beyond reach, building would have been at its height ere this. In fact some of the buildings have already commenced.

The price of labor has dropped some, and will very likely go lower before the end of the year. Some of the labor unions have already announced a drop. Material, too, has taken a downward tendency.

The report of the buildings commissioner for the month of August shows a large increase over the corresponding month of last year. All building work last month amounted to $1,457,098, or nearly twice as much as August of last year, when the total was but $749,904.

New brickwork last month was responsible for the big increase, as $1,276,936, according to the report, was spent on buildings of the first class, against $603,021 in August, 1903.

The erection of frame buildings last month was practically the same as the corresponding month of the former year, with a few thousand in favor of the latter. Frame structure work last month amounted to $58,923, against $54,499 in August 1903. Much was spent in repairs to brick and frame structures.

A. Saint.

Written for The Clay-Worker.

CHICAGO BRICK AND BUILDING SITUATJON.

WHILE A PERIOD of slackness has set in with the present month, bidding fair to continue until the fall election is over, the building season of 1904 in Chicago will still maintain a position as a record-breaker. According to the records of the building department, unless operations and plans for operations fall off altogether, it will eclipse even the season of 1892, when the boom attendant upon the World's Columbian Exposition was at its height. In all parts of the city building projects of various kinds are being carried forward vigorously, and plans yet to be passed upon heap the tables and shelves in the building commissioner's office. Apartment buildings, and notable ones, still hold prominent place in the category now under way, as it were, in the plans, but the apartment building fever, for all this, is considered by some real-estate men to be slightly on the wane. Those who hold this view point out that the construction of this type of building in later years has not been so much in answer to a public demand (although they admit that to question the popularity of the apartment house with thousands of city dwellers would be absurd) as it has in furtherance of a commercial spirit among investors who believed that this class of building erected would always be filled if individual houses did not present themselves prominently to homeseekers—and that they would pay better returns.

Now, however, the home-loving spirit of the people seems to have asserted itself, demanding broader environs than the apartment building offers. People apparently are tired of being "cliff-dwellers" and wearying of even the approach to community life found in the flat building, are turning again toward the individual hearthstone where they will be out from under the sway of a common janitor. Inquiries are being made in greater numbers concerning modest homes in pleasant, but unpretentious neighborhoods. The cost of such homes as have been in demand and promise to become more and more popular in the near future ranges from $5,000 to $9,000. The demand comes chiefly from the more well-to-do class. The structures sought are of the three-story detached or semi-detached type, with fronts of cut stone, or, more frequently, of fancy pressed brick, and brick construction throughout. So well-defined does this demand for single homes appear that many real-estate men are advising their clients to hearken to it and turn their attention to catering to the new line of work.

Meantime, however, the erection of apartment buildings goes on merrily. William H. Barry, of Barry Brothers, who built largely on the South Side, is to undertake to put up 104 apartment houses, most of them three-story structures, in one of the good North Side neighborhoods in the vicinity of Wilson avenue. The total cost of these buildings will be, it is estimated, upwards of $1,500,000. Mr. Barry has entered into contract with William Deering to purchase from him 5,000 feet of frontage at a cost of $500,000. Twenty-four of the 104 buildings contemplated are now in process of construction, and plans are being prepared for twenty more. Sixty more of these buildings will be put up, according to present ideas, within the next three years.

Not only flat buildings and dwellings, however, but schools, churches, hotels and places of amusement are figuring prominently in the season's activity. The new Normal School building is perhaps the most striking of the public structures. With exterior finished in pressed brick and stone, it stands in Normal Park, back from North Normal Parkway, its dome rising conspicuously above any of the buildings in the vicinity. In architecture it is Roman of the Augustine period. The building already completed stands at the east in perfect keeping with its showy neighbor, which will be finished within a few weeks.

Architect R. E. Williamson has completed plans for the Board of Education for a three-story fireproof school building at Loomis and Seventy-first streets. Sealed proposals will be asked within a few days. The exterior will be of pressed brick with stone ornamental work. The cost will be in the neighborhood of $175,000. The School Board's architect has also planned a $60,000 addition to the Austin High School.

After being decades behind its sister cities in the matter of places of summer amusement for a long time, Chicago is to have a new resort opened by the White City Construction Company recently incorporated at Springfield, Ill. A tract of thirteen acres at Sixty-first street and South Park avenue has been decided upon as the site, and it is the plan of the company to erect sixteen large fireproof buildings, housing the most splendid summer amusement venture in the world. Eventually it is planned to add a heating plant, so that the institution can be used winter and summer. The new venture is to be situated within a few blocks of Sans Souci, one of the tolerable places of light amusement in the city, and this fact, together with the connection of men formerly attached to the Sans Souci Park, gives color to the rumor that the older resort is to be closed down. It is expected that $1,000,000 will be expended at the outset. Work will probably be started about October 1st.

The home of the Good Shepherd, which is to be built for the Sisters of Mercy in Racine avenue, between Grace and Byron streets, is being plannnd by W. J. Brinkman, and will cost, when fully completed, in the neighborhood of $350,000. The institution will eventually cover half a block, but some of the buildings will not be put up at once.

An artistic creation of the architect's brain will be the Fifth Church of Christ, Scientist, soon to be erected in Madison avenue, near Forty-ninth street. S. S. Beman is the architect. The structure will be on classic lines, with front of Bedford stone and back and side of pressed brick. The cost is estimated at about $90,000.

D. V. Purington is making a valuable present to the property holders along LaSalle street in the block between Washington and Madison streets. He is relaying the brick pavement put down in block several years ago. The pavement was in better shape than much of other materials in adjoining blocks which has been repaired since the Purington blocks were laid down, but as soon as the work is completed it will be the best piece of street in any part of the city.

Records for August in the building department show that 696 permits were taken out for buildings, the total cost of which was estimated at $3,454,705, as against 489 permits reckoned at a total cost of $2,750,705 in the same month last year. There have been rumors of a boost in the price of building materials, but this has not materialized as yet except in the case of common brick, which is selling nominally for $8 a 1,000, $7.20 a 1,000 net price. Pressed brick and terra-cotta remain as they have been all season.

Scrip.

BRICK NOTES FROM BUFFALO.

Editor Clay-Worker:

Our "brickies" report business, that is, sales, a little slack during August. Weather fine, but pretty cool for rack-drying, and that is the prevailing system in this city.

Henry Bender's yard, at Gardenville, has been fairly busy. Mr. Bender is a member of the Brick Association, and they take care of all sales and collections. He is stocking up now with a winter's supply. September is about our last month for yards without dryers.

I met Brother Weyer, whose yard is at Wanakah, recently when he was in the city. He showed me his hands, which were as hard as any horny-handed son of toil. He had put in a day with the men, taking his share of the labor, and while they did not try to run the boss, the increase in the amount of work done was quite satisfactory. He lost a sale of about 1,000,000 brick to the steel plant, not being able to fill the order in time.

I learn that the Lackawanna Steel Plant has laid off their bricklayers and will not build any more new work this fall.

A friend way up in the northern part of Michigan writes of a few of his trials. They had a white frost nearly every morning during July, and the night of the 30th it formed one-quarter of an inch of ice. Then, on the night of Friday, the 18th of August, they had the worst electrical storm he ever saw. From 7 o'clock in the evening until 5 o'clock in the morning it was one continuous downpour of rain. He had 83,000 brick hacked under a shed outside the dryer. The rain just made small rivers right through them, and he lost about half of them. Then, at 6 a. m., the kiln shed burned down, and at 8 o'clock one of the machine men got caught in the machinery. Luckily his clothes were rotten and it left him nearly the picture of Adam. At 11 a. m. a bar of iron got in the Potts disintegrator and bent both shafts before the machine could be stopped, and, to cap the climax, the 24-inch main belt broke in two. Undiscouraged he went to work with a will, and had everything in running order Monday morning.

Norton.

Written for The Clay-Worker.

NORTHERN OHIO BRICK AND BUILDING NEWS.

BRICK IS IN LIGHT demand. Two of the nine plants of the Toledo Brick Supply Company have been closed down for some time, while a couple of others are running light. The rest of the plants have been running full time and capacity, good business from outside the city having been booked throughout the entire summer season. This closing down and light running of several of the plants is only temporary, so the owners say, as they will be in full operation when the usual fall business turns up. Should the expected trade fail to show up, then it is very probable that these plants will remain closed down, while those running light with others will also close down. A number of the yards are nearly filled to their full capacity, while others are rapidly filling up. The yards of the plants now closed down are overstocked.

"There is a marked slack in the erection of buildings in Toledo this season, that is I mean buildings in which brick is extensively used," said W. O. Dakin, secretary of the Toledo Brick Supply Company. "I know of no cause for this slack other than the substitution of cement building blocks and concrete material in the erection of a number of buildings. The J. M. Bour building, and the structures for two large manufacturing plants in process of erection, are among the largest structures to be completed this season, and in all three instances concrete and cement are used exclusively."

"The building situation is only wiggling along," said Richard Kind, manager of the Toledo Builders' Supply Company.

In verification of the above statements, the records at the building inspector's office show very few buildings in the city which have been erected of brick during the season. Burton C. Ames, of the inspector's office, said that the prospects for the erection of many new buildings this fall were most excellent; however, these buildings will be mostly for dwelling purposes and will be erected of wood, brick forming a small part of the building material this season. There is a good demand for new dwelling houses. For the month of August the inspector's office issued 153 permits. It is expected that twice that number will be issued during September.

That there has not been a great amount of building going on is shown by the last move of the lumber dealers. They have gotten together and discussed the situation quite thoroughly. Prices for lumber seem to be too high and it is learned from good authority that the lumbermen will make a cut in the price of lumber within the next ten days. The largest dealers have been thinking seriously of such a move for some time that they may be able to more freely dispose of the material of overstocked yards.

Not only high prices for lumber, but another thing that has retarded building is the work of the city Board of Reviews. The board heretofore has been adding to the appraisement of property, but it is said that it has come to the realization that leniency should be extended as excessive high taxation is a hindrance to the growth and improvement of the city. With lumber prices cut and with a cessation of detrimental work on the part of the Review Board, it is expected that the building situation will take on new life. The labor conditions were never better for a big boom in building. Architects also report a slack in business.

According to the report of County Auditor Davies, there were erected in Toledo and Lucas county 185 more buildings during the year ending September 1, than in the preceding year. A further investigation of the report shows that the taxable valuation of this year's buildings are close to $100,000 shy as compared with the previous year's valuation.

The county auditor's report shows that 1,294 buildings were erected, of which 1,045 or a little over eighty per cent. were dwellings. For the year ending September 1, 1903, 878 dwellings were erected, but the valuation of these was more than the 1,045 put up this last season. All this goes to show that cheaper building material is being used, and that there has been a slack generally along the building line during the season thus far.

This report also shows from the taxable valuations, that the buildings have been constructed of cheaper material. In this connection, it might be stated that much building of the season has been in additions and repairs to buildings.

The Perrysville Tile and Brick Company has its new plant in fine running order and for some time the new concern has had more orders than it could fill. Business in that section is so good that the company is having another large kiln added to its equipment.

Among the largest contracts let during the past month is a residence for E. G. Shawaker at Scottwood and Delaware avenues. Gottlieb Schever has the contract at $5,000, the structure to be of brick and shingle

A $25,000 church building is contemplated by the St. Matthew's English Lutheran church.

Architects Langdon & Hohly have drawn plans for a two-stroy brick flat building to be erected near the corner of Kenilworth avenue and Fulton street, the cost being placed at $15,000. The building will be 72 x 44 feet in size and will contain four six-room flats.

The Salvation Army is contemplating the erection of a new building at the corner of Michigan avenue and Illinois street. The structure is estimated to cost $20,000.

Augusta Schluter has had plans drawn for the erection of a modern two-story frame double house at the corner of Warren and Batavia streets, cost estimated at $5,000.

No new paving contracts have been let within the last several weeks. Many jobs are being finished while some are just being begun.

Steps are being taken to protect Toledo's pavements. All gas and water connections and mains must be laid at a specified time before a pavement is put down, or wait until a pavement is down five years before it can be torn up for such purposes.

John E. T. Nicks, who has offices in the Nasby building, has discovered a new system for the drying of brick at the nominal cost of ten cents per thousand. In one plant where the system has been installed, 48,000 bricks are dried in twelve hours and only a ton and a half of coal is used. The system can be applied to any brick plant with but a small cost.

The Lake Erie Asphalt Block Company of Toledo has been sued for $5,000 damages by Harry W. Straits, a seventeen-year-old boy, who claims he was injured to that extent in his hand being caught in a revolving shaft at the plant.

Irving E. Macomber, manager of the brick business of A. E. Macomber & Company, will become a benedict on Thursday, September 15th. The groom-to-be and Miss Marie Becker, of Milwaukee, will be united in marriage at 8 o'clock in the evening at the home of the bride's parents, Mr. and Mrs. Gerard Becker. The couple will take a wedding trip and return to Toledo about the first of the month to reside.

Upper Sandusky (O.) has just completed its first mile of pavement at a cost of $50,000. T. O. D.

SCOTT & OLIVER MFG. CO., KNOXVILLE, TENN.

The name of the above company has been changed to the Wm. J. Oliver Manufacturing Company, and their charter amended so as to increase the capital stock of the concern from $50,000 to $100,000. Mr. Alex. McMillan and Mr. Alex. A. Scott, formerly of this company, have sold their interests to Mr. Wm. J. Oliver, and he has assumed active control and operation of the plant, greatly improving and enlarging it, doubling its capacity and putting things in moving order. This company will manufacture a complete line of clay, mining, dump and contractors cars, hoisting engines, light locomotives, brick machines, the Scotts patent brick car and drying equipment, together with wheelbarrows, etc. They will have the most up-to-date plant in the South, and are prepared to take care of any kind of orders, large or small. They have improved the Scotts system for handling and drying brick, having secured exclusive control of these patents, and will put this on the market in connection with their other lines. The officers of the new company are W. W. Wallace, general superintendent, W. J. Oliver, president, L. C. Gunter, secretary and treasurer.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Good Prices in Nebraska.

Editor CLAY-WORKER:

Enclosed find $2.00 for our subscription to THE CLAY-WORKER. Business is very good now. We are paying $2.00 per day for every man in the yard except the temperer, who gets $2.25. We sell kiln run of brick on cars at Hooper for $7.00. We charge $7.00 and $8.00 when the farmers take them from the yard. There is a new yard at Stanton.

HOOPER BRICK MANUFACTURING CO.

A Successful Season.

Editor CLAY-WORKER.

Enclosed find P. O. order for $2.00 for our subscription for another year. We have had a very successful season this year, and are getting our waste heat down to a minimum. It took some time to study the characteristics of our clay down to a fine point, but now we can handle it to perfection. We have the best equipped plant in the State and are running it to its full capacity, so far as drying and burning are concerned, which is about equal to 100,000 three-inch tile per month. We use sawdust for fuel for our boiler, and slab-wood in our kilns, which is quite a saving to us.

F. G. R.

Sherwood, Ore., September 6, 1904.

The Modern Idea Works Well in Canada.

Editor CLAY-WORKER.

Enclosed you will find P. O. order for $2.00—a year's subscription for your valuable paper. You sent me a copy some time since, and, as we started a new brick plant this spring, we ought to have THE CLAY-WORKER. Fifteen of us started in this spring without capital, and have now a $25,000 plant in full operation. As we had no funds, we were compelled to incorporate and are now selling shares. We have a good plant and plenty of clay, and all we need is capital to work it to the best advantage. We can make from fifteen to thirty thousand brick per ten hours. As we had to build the plant, we have not been able to make more than 1,100,000 to date. We have a prosperous town of about 8,000 inhabitants, and Port Arthur, another town of the same size within five miles. These two towns are growing very rapidly, and the demand for brick is good. Brick sell from $10 to $12.50 per thousand. Our dry-racks hold 250,000 at one time, and a good drying place. With a favorable season next summer, we can easily make three million brick. Stock is sold for $1 a share, but not less than twenty-five shares are sold to a single party. Every block of 100 shares has a vote. With best wishes for your paper and our plant,

K. O. BRUNE, Mgr.
The Mt. McKay Brick and Tile Company.

The Brick Situation in Maine.

Editor CLAY-WORKER:

The brickmaking season in Maine closed the first of September. The output is far below that of any previous year, and it is the earliest closing yet. In the vicinity of Bangor, the output was as follows: W. S. Heller & Company, 1,600,000, William Burke, the same, Hugh O'Brien (stiff mud) 1,800,000, and John McDonald, 700,000. About 2,500,000 will be wintered here. Notwithstanding the slackness in demand, prices remained firm at $6.50 to $7.00.

I asked the manufacturers how it was that in dull times such as this, the price did not fluctuate. Formerly in dull seasons, the price fell as low as $4.00 a thousand. The answer was that owing to the change that has come about in the producing capacity of a man on a brickyard, $7.00 represents about as little profit as $5.00 did in the old days before unions came into existence. The decreasing capacity of men and the increasing cost of fuel have resulted in forcing the cost of bricks to a higher level. And yet for all he said, I know that every manufacturer of brick in Maine made money this year, and some made lots of it. The manufacturers themselves have changed most wonderful of all. They now realize that their profit is in maintaining the price.

BREWER.

Anent the Porosity of Dry-Press Brick.

Editor CLAY-WORKER:

The very fine article on Laclede Firebrick Manufacturing Company, St. Louis, pages 144-148 of the August CLAY-WORKER, interested me greatly. St. Louis was at one time my home in the far too distant years, and on Compton Hill, under the ægis of ye "hydraulic" I took my degrees on "Dry Pressed Brick." I got a "sterling" balance on the process and product, hence the lucubrations that follow.

Referring to page 144, right-hand column, under the picture of factory office building, third line, I find, "We all know what a long-enduring prejudice," etc., and on "though the principal or only objection to the dry-pressed building brick—it being more porous than a mud brick."

Now, my dear boy, my time was 1868 to 1872 in St. Louis, and my home was with a noted front bricklayer, and I greatly mixed up with his fellow craftsmen, and the big fight then was against the hard surface and non-porous nature of the hydraulic or dry pressed brick.

Now how is this, where are we, after thirty years to have it written down that a brick that approximates the density of marble is more porous than a mud brick? If Rogers who invented the hydraulic was alive this would give him heart failure.

RYAN.

The Scum Trouble Overcome.

Editor CLAY-WORKER:

I am much indebted to THE CLAY-WORKER and the correspondents who came to my relief on the scum trouble. Thanks to the advice and information given, we have overcome the difficulty. Our trouble was due evidently, partly to the lime in the clay and partly to bad draft in the kilns, and sulphates in our coal. Our coal is very inferior for watersmoking, as it will not burn free. The lime got into the clay through the tearing down of some old houses that were in our way. The plastering and mortar in the flues cause the trouble. The scum could be plainly seen on the brick when drying; that is, in places where we dried slow, and the slower the brick were dried, the more scum there was. We dry some of our brick on a second floor made of slats, and it takes several days to dry as the only heat is that which comes from a hot floor nine feet below, and on this second floor is where we got most of our scum brick.

We are still using the clay that is permeated with the lime, because we are getting our clay from a steep hillside, and the point where the houses are located is still above the point where we are now getting our clay, but all our trouble has disappeared. I had to act quick for we were turning brick out very rapidly, and they were white as chalk, instead of red, and they looked soft. What we wanted was a dark vitrified paving brick. I ordered a car of coke with which to watersmoke the kilns, quit using steam on the die and used cold water, instead of black crude oil, I used a light colored oil made specially for brickmakers, and separated the brick on the second floor so they would burn dry more rapidly, and now I don't have a particle of whitewash on the brick. All my trouble in that line has disappeared, and I give the credit to the coke.

I had thought of using carbonate of barytes, and went so far as to inquire into the price, and fully intended to use it in case the other remedies failed. The trouble came on us suddenly. We had been making brick in the same location over twenty years, and never had anything as bad before, although we have had slight cases at intervals of five or six years, and they disappeared as quickly as they came. We can watersmoke much faster with the coke than with our coal.

I thank you for your kindness in this matter, and also Mr. Ben There, Mr. R., and Mr. Will P. Blair for their advice. I think like Mr. Blair, that it is very difficult to determine just what does cause this scum, but any person who encounters this trouble will receive a large amount of help and information by reading the July and August numbers of THE CLAY-WORKER.

W. G. M.

A Suggestion for Sand-Lime Brick Promoters.

Editor CLAY-WORKER:

Your August CLAY-WORKER shows my Atlantic City article in such good form that it looks better from my point of view than my manuscript, which at times editors find a hard matter to shape up as to chirography, punctuation, etc. If the Huennekes Company and other sand-lime brick companies could be made to see the need of organizing subsidiary companies auxiliary to their brick manufacturing plants, to build one-story cottages, and two-story homes (for two families) for our steady workingmen, the company would realize, I am certain, great profit and thus become a blessing to a mass of people who have no "hearths and firesides" and "home altars" to fight for in "the land of the free and (the ever) brave."

There is principle and pelf in this, to be, enterprise, and the idea as a social problem is vital. As a special enterprise it has never been entered into largely by building material producers.

The Huennekes Companies are the most fortunately equipped to become pioneers in this matter, and in their unique material and low cost of producing it, they can largely aid in solving "homes for their American workmen." There is most assuredly plenty of ready capital to found such subsidiary companies, as the investments would rest on quite solid financial foundations, and the investments could win good profits out of stocks that would need no "water" to float them. Long payments, as to time of paying for homes, and to an extent co-operative principle would be mainly my plan, at least as a suggestion. RYAN.

Should Paving Brick Have Space Lugs?

Editor CLAY-WORKER:

It has been my privilege during the last few months to visit several of our Eastern cities and drive over the several kinds of pavements now in use. The one that I was interested in most was, of course, vitrified brick and block, of which we have some fine work in many of our cities in the Eastern section of our country.

I noticed in one city in particular a light-colored block made in Pennsylvania, that seemed to be fairly well burnt, and of even size and free from objectionable kiln marks. But to my mind a mistake was made in the block having a very large lug on one side. These lugs were made the ordinary way by countersinking the top press plate, and tapered to a point, this lug extended fully one-half inch when burnt from the face of the brick, and when laid caused an opening of half inch between the blocks. This is the largest lug I have seen in the East here, or have heard of. Now why I say this is a mistake, is, in driving over a number of brick paved streets one can easily detect a street paved with brick or block with lugs on, and one that is not. I refer particularly to a street that has been laid two years or more, and with a traffic that has worn out the cement grout to depth of the bend of the brick, the consequence of which is that the surface under these conditions causes a much more noisy pavement and not near so well looking in appearance, as if less lug had been used, or better still, no lug at all.

There never was a cement made that I have heard of that will wear as well as vitrified brick and it is doubtful if there ever will be, and for this reason the more of the street surface that can be covered with a thoroughly vitrified brick or block the better will be the street, in every particular, both as to durability, general appearance, and comfort from less noise.

I do not wish to infer that brick pavements are more noisy than others, because they are not, but there is a difference in a street laid with open joints, no matter what the material may be, and one that is not, and in brick or block pavements it seems to be in favor of the brick without lug.

If this be a fact, it seems well worth the consideration of paving brick manufacturers who are seeking to produce the very best paving material possible. But the answer no doubt to this question from some will be, that the grout gets down between the brick in larger quantities and helps to hold them together better, to the former I must agree, but to the latter it is an open question which, for my part, I doubt very much, as when a street paved with brick or block with lugs on there is a tendency to use too coarse a sand with the cement, whereas when brick are used without the lug, nothing but the finest sharp sand can be used in the cement grouting. I rather think the object, with some especially, in using such a large lug, is that their brick and block will cover a larger street surface and saves them a little in freight, than if they did not have it that way.

I have observed very closely for the last five years the difference in appearance of bond edge brick laid without lug, and those laid with, and also the regular square edge brick either repressed or what is known as the ordinary wire-cut, all of the same manufacture, and have to admit that the advantage under apparently equally heavy traffic is with the square edge or wire-cut brick. Some, of course, advance the idea that this pavement is more slippery than with the bond edge brick, which does not prove to be so, as one is inclined to think without having noticed it. In fact, as stated above, a vitrified brick pavement is not a slippery pavement by any means, and cannot be compared to any of the asphalt pavements that are now in use in that line. And I have seen streets paved with square edge wire-cut brick that after years of wear, are as smooth pavements as could be asked for and as noiseless as any pavement could be expected to be.

This being the case, it would lead us to ask the question, whether it is not better for both paving brick manufacturers and for the public at large to use the plain wire-cut vitrified brick or block, doing away with all lugs and repressing. Another point in their favor is that when the wire-cut brick were tested by the National Association to determine these facts, years ago, the plain wire-cut brick stood better than the repressed. H. H. H.

A Good Start for a New Virginia Brick Plant.

Editor CLAY-WORKER.

Enclosed find P. O. order for $2.00, amount due for THE CLAY-WORKER. I have been away from home almost all the time since subscribing for your paper, but have had it forwarded to me. I went to Petersburg, Va., in March, and built a neat little plant for the Chesterfield Manufacturing Company. They have a running capacity of 60,000 per day, but do not make but 35,000 on account of not having drying facilities. They make a fine brick and get good prices for all they can make. The company has a J. C. Steele & Co. outfit and are well pleased with their plant.

I am now building a plant for the Guyan Valley Brick Company, and will put same in operation in about two weeks. The writer is inclined to think that the plant will be about the smoothest thing of the kind in the State, as the company is composed of successful and up-to-date business men, in their different lines, and do not believe in half-way doing things. They are starting in with a Steele outfit composed of disintegrator, pugmill, brick-machine side-cut automatic cutting table, cars and drum, Houston, Stanwood & Gamble Co. engine and boiler of 125-horse power, and a four-track National dryer, and will put in two dry-pans and another five-track dryer as soon as they get the present arrangement started up. They have an immense deposit of fine clay and shale for making paving and red building brick. After working their common clay down to a depth of sixteen feet, they get a dark blue clay, which burns a beautiful buff color and will make a very substantial brick. The writer has built and started some of the best plants in the country, but I am frank to say that I do not know of a company which has started into business under more favorable circumstances. The officers are, Mr. George E. Thornburg, a merchant, Mr. P. H. Swann, a doctor, and Mr. T. W. Payton, a lawyer. There are two other men who are stockholders. One of them is the Democratic nominee for sheriff of the county and will be elected. This looks like a strong combination to me, and one which ought to be able to meet any emergency. K. Y. L.

PATENT SUIT.

Suit was brought Feb. 23, 1904, against the Hamilton Brick Co., of Hamilton, Ohio, by the Horton Manufacturing Co., of Painesville, Ohio, for infringement of their patent on their Hercules brick machine. The Hamilton Brick Co. is using a machine made by the Arnold-Creager Co., of New London and Cincinnati, Ohio, and is called by various names such as "S. S. S.," the "New Century," the "Success," etc. 5 tf L.

Written for THE CLAY-WORKER.

FROM JOHN SULLIVAN'S YARD, LANDSDOWNE, PA.

SPINNING ALONG at a rapid pace, the refreshing breeze in our faces, the glorious sun at our backs, we ordered the trap to draw up in front of the office of John Sullivan, brick manufacturer, Landsdowne, Pa., glancing meanwhile to the trim yards beyond, where the bricks were stacked, ship-shape, and the men heartily doing their various duties.

The mention of THE CLAY-WORKER was the open sesame for voluntary information on the one side and an interested listener on the other.

At the above-mentioned yard all is brisk energy and prosperity. With their Monarch machine doing good work, they have turned out 4,000,000 bricks during the year from this yard, which boasts of four ten-arch kilns, two seven-arch kilns, a dryer of 20,000 capacity, and a rack-room holding 255,000.

Up to date 272 small six-roomed dwellings have been built of brick from Sullivan's yard, in spite of the fact that the Philadelphia market for hard brick is particularly dull, just now, this city having a greater stock on hand than it has had for the past four years.

Considering that this firm depends almost entirely upon the Philadelphia market, one can truly and naturally surmise that gratifying prosperity abides. My genial informant, with kindly eye and bright smile, furnished us with an interesting bit of news.

Not long since, a deputation of twelve men—clayworkers from Europe—visited this country, viewing American brickyards. This deputation comprised three Swedes, two Danes and seven Germans. One of the last-named owned and operated an establishment just outside Stuttgardt, the capacity of his yard being 25,000,000 per year.

Another German—a youth—had earned this trip as a prize or scholarship, offered by a technical school over there, and was naturally enthusiastically interested in everything pertaining to bricks and their uses.

All of these representatives expressed great surprise at the facility and rapidity with which the brickyards here turned out bricks, taking photographs to emphasize their remarks.

This deputation, by the way, was in the charge of Mr. Chris McDermott, president of the Brick Machine Manufacturers' Association, who came on from Wellington, Ohio, and met the visitors in New York City.

REAN'S BRICKYARD, ALDEN, PA.

"Straight out Providence road—that's the way—leads you directly to the rear of the new brickyard at Aldan, Delaware county, Pennsylvania."

Correct say we, and found, not exactly a new brickyard, but one which had changed hands, after lying idle for about two years. This was formerly DeVinney's yard, but is now under the management of Mr. Rean, strong of courage as well as physique.

Wending our way towards the broad shoulders, we found him under the shed, directing here and there, for you must know they are just placing a Chambers machine and hope to be in working order by Monday, August 29th.

They will have two kilns and expect to turn out 40,000 bricks daily.

In reply to the question as to filling orders here in Aldan, Mr. Rean said, "No, we just finished one kiln last week, but the orders are usually given in quantity. Unfortunately, this firm just missed one order for six or eight million bricks, being handicapped by this changing and righting machinery, etc.

Mr. Rean is not new in the brickmaking business. To use his own words, "he was brought up in it," and assisted his father at one time in making bricks by hand. His father is located in Lancaster county and is a subscriber to THE CLAY-WORKER.

Hard brick—common building brick—is the kind this yard will turn out, depending mostly upon the Philadelphia market.

We regret to report the sad news of the sudden demise of David Murtha, the widely-known brick manufacturer, and father of David C. Murtha, of the firm of Murtha & Earley. The funeral services were held on Saturday afternoon, August 21st, from his late residence, 5912 Ridge avenue, Roxborough, Philadelphia.

W. E. L.

PITTSBURG BRICK SITUATION.

Pittsburg brickmakers are now wearing their happiest smiles and have taken on a joyous aspect as they go among the kilns or thread their way through dust-beclouded works where men are as busy as bees handling the little blocks of clay that form such an important part in building up a city.

The reason these makers of brick are happy is because there are so many million bricks to be delivered this fall. Some enormous contracts are on the carpet, such, for instance, as the new Carnegie institute, which will require 22,000,000 bricks, and the great warehouses for the South Side, which call for 12,000,000. Then there is the furnishing of twenty million or more of brick for the new Carnegie technical school. Two million bricks will be necessary in the construction of the Diamond National Bank building, at the foot of Fifth avenue, and there are innumerable other business buildings requiring great numbers of brick. In addition there are dwelling house contracts for 200 houses that will require 5,000,000 brick at least.

The great fire in Baltimore that laid waste acres and acres of brick and mortar has created a great market for brick. It is said 250,000,000 brick are required there. Pittsburg is getting some share in this, one firm capturing a contract for several million brick recently. Local brickmakers, however, say it does not pay to ship brick as far as Baltimore, where the freight is $7 or $8 a crate, especially when it is borne in mind that the Monumental city has its own brickmaking plants and, in addition there are hundreds of brickyards in Maryland. The average consumption of brick, that is, common building brick, in the Pittsburg districe, is about 200,000,000 brick a year, dealers say. At present there is no great rush in the brick manufacturing line, half the yards, in fact, not being in operation, but when the fall orders are fulfilled "everything will hump," as one manufacturer expressed it. Brickmakers work piecework, so that when a job is done the works are idle until the next contract is entered on. Some works shut down for a few days or a week only. Business is slack as compared with what it was two or three years ago, when the brick works of the country were working night and day, three shifts being used at some plants. There is not much building being done at present on account of the high prices and labor troubles. What work is underway, however, is of a heroic magnitude, such as the Carnegie institutions, the warehouses mentioned and the rows of dwellings. The ordinary housebuilder, however, hesitates to erect a domicile in this year of grace.—*Pittsburg Leader.*

NO PROBABILITY OF COLLISION ON THE PENNSYLVANIA LINES.

Complete Block System Between St. Louis and New York.

The Pennsylvania lines have announced the completion of a block signal system on the Indianapolis Division of the Pan-Handle, between Indianapolis and Columbus. With this system they are now completely furnished with either manual or automatic block signal systems between St. Louis and Jersey City.

Within the last few months the Vandalia has completed and put in successful operation a complete manual block system between Indianapolis and St. Louis. The placing of the same system on the Indianapolis system of the Pan Handle was the last step in the completion of the work on the main East and West Line of the Pennsylvania Lines.

Between Indianapolis and Columbus the block stations, in each one of which is placed an operator, are about five miles apart. The "block" trains in both directions, being what is known as absolute for passenger trains and permissive for freight trains. No passenger train is permitted to enter a block—the stretch of track between two block signal stations—while another is in it, although one freight is allowed to follow another into a block with the caution from the signal-man that it must run at a rate of speed that will allow it to stop short of any obstruction. A passenger train is allowed to follow a freight into a block with the same understanding, but nothing is allowed to follow a passenger into a block.

The block signal system approaches perfection so nearly that if rules governing it are observed by trainmen, the possibility of a collision is reduced to the minimum. Every mile of a train's run is under the eye of an employe, and its progress is more closely watched and its movements can be better directed by the dispatcher than was possible before the adoption of the system.

The Pennsylvania lines have made an especial effort to complete the block signal system at this time because of the heavy traffic to the St. Louis Exposition.

On some of the Eastern sections of the Pennsylvania lines, the automatic block signal system is used, with automatic spacing signals, which are supplemental to the blocks, between block towers at the more dangerous points on the road.

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING NEWS.

PROSPERITY CONTINUES TO hover around the brick plants of this part of the country, and if there is any complaint at the present time, it is on account of too much business in sight. Several of the larger companies state that they have over sold, and hardly know how they are going to take care of the business now booked, let alone take care of the business already in sight, the contracts for which have not been let.

While talking in the office of one brick company, where the product had been sold ahead for some time, there was a telephone call, and inquiry made for 2,000,000 brick. They want to supply this extra contract, for it is for a good friend, and the question now is where will they get the brick to supply this extra demand. This seems to be the story of most of the paving brick people at this time, as more is heard of the contracts which they have been forced to turn down entirely than of those which were taken, and which will probably not be filled as promptly as expected, owing to the fact that the output must be divided among so many, to keep everything moving at the same time.

We have been hearing about the big surplus of brick that will be pushed upon the market out here, owing to the large increase in the number of the plants in the Kansas gas field, but from the present indications there will be no surplus for a good while to come if the brick turned out by the plants is up to the right grade. There may be a surplus of poor brick, but if the plant is under the charge of a man who knows how to make brick of the right kind, and there is a reasonable amount of hustling done, there is no reason to expect a big surplus for a good while to come, for the demand in this section seems to be increasing as the supply increases.

The building records of this city show that the month of August was a banner month for residence building, and the permits include a large number for fine residences of both brick and stone. Flats and apartment houses are still being built here in considerable numbers, there seeming to be a craze for that kind of an investment, in spite of the fact that there now appears to be too many of the new ones for the probable extra demand. The building permits for the past month were nearly double in value the permits for the same month of last year, the figures being $810,270 last month, and $493,650 for August of last year. Of this cost $383,450 was for the construction of 52 brick buildings, the combined frontage of which amounted to 2332 feet.

Frank Slutz, superintendent of construction in the city engineer's department, has made a report of work done in street paving and street repairs by the different companies, under the direction of the city. This report covers the period from May 1 to August 16 of this year, and shows that 98 blocks of new paving was laid, while 137 blocks of repairs were made under the maintainance guarantees, and 126 blocks of repairs have been made under new contracts. The cost of this work was $818,815, and the streets paved and repaired covered a length of more than 40 miles.

The Union Brick Company, of Iola, Kansas, is furnishing the brick for the extension of the Baltimore Hotel, the finest hotel of this city, which is adding 100 rooms on the south.

The Pittsburg Brick Company has been awarded the contract for over 2,000,000 brick, of the strictly No. 1 quality, to be used in paving the streets of Beaumont, Texas.

The Kansas City Twentieth Century Brick Company will soon begin the manufacture of a sand-lime brick in this city. This company will represent a capital of $725,000, and will not only make the new brick here, but will also put up a factory for the machinery for making the brick, and will supply the machinery to other plants throughout the country. The first plant to be erected will only be a temporary one, until enough brick are turned out to put up the permanent plant, when the capacity will be placed at 100,000 brick per day, with the expectation of doubling the capacity in a short time.

The site for the new plant is said to have been chosen on the line of the Kansas City Outer Belt railway, but as the property has not yet changed hands, the promoters refuse to state exactly where it will be. The machinery for the new plant is already beginning to arrive.

A. E. Stilwell, the president of the Orient Railway, has been instrumental in organizing this company, and he will be one of the directors of it, as will also W. A. Williams. E. D. Steger, of Bonham, Texas, is the practical man of the enterprise, and will be the president of the company, which will make use of his own processes, which he has developed during the past two years in his experimental plant in Bonham. U. S. Epperson, of this city, will be vice-president and general manager.

Mr. Steger says that the experimental plant, in Bonham, has been running day and night of late, and cannot keep up with the orders, and that another plant will be started in Memphis, Tenn., within a very short time, and eventually the company expects to furnish machinery from this plant for other plants in all parts of the country, as the process makes a good brick at a very cheap price. The United States and Mexican Trust Company, of this city will be the financial agent for all the company's plants in the United States.

Pine Bluff, Arkansas, is going to do some paving right away, having let the contract, and the Pittsburg Brick Company has taken the order for 800,000 of their No. 1 pavers.

Fifty of the teamsters of the Kansas City Hydraulic Pressed Brick Company went out on a strike August 17th, demanding $2.00 per day, instead of $1.85, which they had been paid. That was 10 cents per day more than the same class of labor is classed by the unions, and still they struck. The company was handicapped for several days on account of inexperienced workmen, but they had the best of police protection for their men, and the hearty support of the Employers' Association, which soon put them in a position to be independent of the strikers. At this time the company has all the good workmen it needs, and the strikers who have not gone back to work are wanting to go to work very bad. The union will no longer control, for the company has decided to have an open shop in the future. There has not been a winning strike in this city since the Employers' Association was first organized, and that has been nearly two years ago. This fact is attracting the attention of manufacturers in various parts of the country, and is bound to be a good thing in developing this city. Owners of factories like to have them located where they will be protected against mob violence, and get fair and square treatment by the city, and this is what the Employers' Association is doing in Kansas City.

The Pittsburg Brick Company has secured the contract for furnishing another 500,000 paving brick to Chanute, Kansas. Their brick has been used in Chanute a good deal, and the people of that city seem to have the opinion that there is no other kind of paving brick made.

The Kansas City Paving Brick Company has taken the contract for 700,000 paving brick to be used in paving the streets of Trenton, Missouri.

The Home Brick Company has been incorporated in Caney, Kansas, with a capital stock of $42,500, and will at once begin the construction of a plant.

CONCRETE BLOCK MAKING.

"STONE-MAKING" is the title of a neat little book published by Pettijohn Bros., Terre Haute, Ind., in which is told the story of their concrete hollow block, the manner of its manufacture and the appliances necessary for same. It is embellished by a number of fine half-tone engravings. Those of our readers who are interested in the manufacture and use of hollow concrete block are requested to write them for a copy.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

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☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

VOL. XLII. SEPTEMBER, 1904. No. 3.

CURRENT COMMENT.

If you build it of good brick there is no guess work about it, you know it is good.

* * *

Land drainage or farm tiling is a mighty good thing, and should be pushed along.

* * *

At every step in the process of making a brick there is a chance to help or hinder the sale of it.

* * *

There is room for mechanical genius to get in some work on the problem of loading and unloading brick.

* * *

With cement blocks on one side and sand-lime bricks on the other, the old-time brickmakers are wondering what will be the outcome.

* * *

From a financial standpoint, the best clay is that which is intelligently converted into the product for which it is best adapted.

* * *

No machine is good enough to sell itself till after it gets an introduction to the prospective buyer, and that is where the trade papers and the salesmen come in.

* * *

A few drops of oil on a journal before it gets hot is worth more than a pint afterward. Also, it is better to put a new lace in that belt a day or two before, than one minute after it breaks

* * *

The true idea in adding labor-saving machinery in the manufacture of brick is not to reduce the number of laborers required in the industry, but to increase the quantity of brick used by lowering the item of cost.

* * *

Twenty-five cents worth of horse sense ought to be enough to prevent two mistakes that we run up against occasionally. One of these is the continued operation of an old, out of date machine where a modern one is needed, and the other is the installing of an expensive one hundred horse machine in a one-horse brick plant.

* * *

Clay water pipe has some advantages as compared to iron, among them being cheapness and durability, two points that when seen in the right light are difficult to overcome.

* * *

Yes, and a clay pipe won't rust either, so there.

BRICKMAKERS' DAY AT THE WORLD'S FAIR.

And now, in the glorious days of the first week in October, the clayworkers are to meet at St. Louis and explore the great Fair that has been exciting the attention of the world all summer, and Wednesday, October 5, is to be Brickmakers' Day. The National Brick Manufacturer's Association is to gather at St. Louis October 3, then, after they have familiarized themselves with the lay of the ground, the King of the Fair, President D. R. Francis, will turn the Fair over to the clayworkers for a day to do with as their pleasure may dictate. After that, after the brickmakers have taken the Fair and rested from the effort, on Thursday evening, October 6, there will be meted out a sample of Kentucky hospitality by the colonels from the "Bluegrass" State, headed by Mr. Wm. F. Keates, of Owensboro, at the Kentucky building, which is right near the southeast corner of the Palace of Mines and Metallurgy, the great center of interest for clayworkers.

THE CLAY INDUSTRIES EXHIBIT.

The most interesting place for members of the N. B. M. A. will be found in the northeast corner of the Palace of Mines and Metallurgy, as that is the main space set apart for the display of clay products, and the trade is very well represented there, as has been shown in these columns heretofore by both illustrations and descriptive matter. The National Brick Manufacturer's Association exhibit of brick from all over the world will bear careful scrutiny. This space with the easy chairs and the Secretary's "smile that won't come off" will naturally be the chief place of rendezvous during the week. At the opposite end of the Clay Industries exhibit one can also see sand-lime brick and cement blocks being made, two side-issues that are of more than passing interest to brickmakers right now. Then at the lower end of the Mining Gulch, which comes down near the southeast corner of the building, is to be seen the display of the Portland cement manufacturers, which has been a little slow about assuming shape but will probably be completed by that time. And, just above it there is a pottery plant in full operation that should be a center of interest to all clayworkers. In addition to these displays, there are quite a number of brick and terra-cotta displays in the big Manufacturer's building, while over in the Palace of Varied Industries there is fine art pottery galore, some of our foreign co-workers, and especially the little fellows from Japan, and the great potteries of England, making a great showing. Now, just take a little map of the grounds and you will find that these buildings are easy to locate and can be very conveniently reached from the Mines and Metallurgy building as a starting point.

THINGS WORTH SEEING IN MACHINERY HALL AND OTHER BUILDINGS.

Aside from the clay products to be seen in the buildings named, there are sights to see that are interesting to all in each of the big palaces on the grounds, and some of these you will find are of special interest to the craft. For example, up near the center of Machinery Hall there is a great show in pulleys and belting, and in one booth there is a leather belt actually running in water to demonstrate that both belt and glue are of the waterproof class, a mighty interesting demonstration to a class of men who have probably more worry from moisture damaging belts than any other class. Economic power production is a strong feature in this same building, and the very latest things in boilers and engines are displayed. There is also a good showing in pumps, a line of mechanics specially interesting to clayworkers. In the Transportation building, in the display of the Walter A. Zelnicker Supply Company, there is a study in clay for railway stock-guards that suggest future possibilities of expansion. Then there are numerous studies in transportation, including moving platforms.

THE AMUSEMENT SIDE OF THE EXPOSITION.

When you get tired of seeing the real show and want a little amusement, there is the Pike a mile long, paved with brick and lined on each side with all sorts of shows from Creation to Hereafter, where you can get amusement in endless variety, a fair share even without going inside the shows. And every thing goes on the Pike, so if there could be managed a concerted hike to the Pike of the whole gathering, with horns and bells and other noisy things, it would make a jolly evening. The Concentrated Order of Hoo-Hoo, the secret society of the lumber trade hiked to the Pike in a body on the evening of September 12, about 2,000 strong, with bells, horns and hoo-hoo yells, making a sight worth going miles to see, and there is nothing to prevent the brickmakers from doing the same thing if they can just bunch the crowd—and its the greatest treat yet.

GETTING LOCATED.

Where to go and how to best reach the grounds, though, is probably the thing that is most seriously concerning the prospective visitors right now, so a few words along that line will not be out of place. There are three important entrances to the ground, and several minor ones. The main entrance is reached by Olive street, Delmar and suburban cars and by the Wabash shuttle trains from Union Station. The Olive-street cars can be boarded anywhere down town on Olive street, the suburban cars on Locust below Tenth and the Delmar cars on Washington avenue. On Washington avenue one can also get the Page avenue cars, which go direct to the Administration entrance on the north side of the grounds. The Inside Inn entrance, located in the southeast corner of the grounds, is not a great ways from the Mines and Metallurgy building, and only involves a short, pleasant walk through the Plateau of States. This entrance can be reached by taking Market street or Laclede avenue cars, all of which run on Market street down town, going directly in front of Union Station. There are a few other car lines going to the grounds, as well as an automobile line, but the ones named are the most important.

WHERE TO STOP AND HOW TO GET THERE.

Members of the Ceramic Society stopped at the Plaza Hotel, No. 3127 Locust street, and recommend it highly. Here good, clean, comfortable rooms can be had for $1.25 per day, European plan. In the immediate vicinity there are a dozen or more private residences where comfortable rooms can be had at $1.00 per day. Besides the Plaza cafe there are several restaurants within a block. To reach this locality take Olive street car and get off at 32d. Locust runs paralell with and between Olive and Washington streets. On the latter are the Page avenue and Delmar trolley cars. It is a very convenient point to be located, being about midway between the exposition and downtown district. Those who "don't care for expenses" can find more sumptuous quarters at the hotels, but they will be little if any more comfortably situated. The frequency of the cars on the Olive street line make that the preferred route. None need stay away for fear of not securing comfortable accommodations. There is room for all.

The mechanical digger or steam shovel can do nearly everything but vote, and we don't need its vote.

THE WORLD'S FAIR MEETING OF THE AMERICAN CERAMIC SOCIETY.

The summer meeting of the American Ceramic Society was held this year at the St. Louis Exposition. The summer meetings of the Society are always devoted to field work or the visiting of potteries and other interesting clay plants, while the winter meetings are reserved for the more formidable reading and discussion of technical papers. In view of the magnificent lot of ceramic ware exhibited by foreign countries at the World's Fair, it was decided to hold the summer meeting at the St. Louis Exposition this year. The members appreciated the great value of this opportunity to study the foreign ceramic products, as well as the unusually fine exhibit of the American manufacturers, by making this the most successful meeting thus far held, as thirty-six members and associates were present, or about twenty-five per cent of the membership.

The Society made its headquarters at the office of the Clay Industry Exhibit at Block 20, where Messrs. Wheeler and Sasse tried to make them at home. The Society was very much gratified and pleased with the fine character and diversity of the American clay products that are concentrated in Block 20, where the finest series of exhibits ever produced in this country are tastefully grouped. The foreign exhibits in the Manufacturers and Varied Industries buildings were given careful attention, as well as the fine Chinese exhibits in the Liberal Arts building. The exhibit of Sevres ware in the French government building was recognized as the finest display of this world-renowned ware ever seen in this country.

The local membership, under the guidance of Messrs. Lemon Parker, S. Geijsbeek and H. A. Wheeler, concentrated the visiting members at a very pleasant Dutch dinner that was given at the picturesque Tyrolean Alps Cafe on Tuesday evening, the 6th. An effort was made to have the visiting members make a trip through the clay plants in St. Louis, but the exposition attractions prevented the carrying out of this project.

It is very flattering to the Ceramic Society to note that of the seven jurors selected to pass upon the clay product exhibits, four were members of the Society, or Messrs. Walker, Orton, Ries and Richardson, while two of the remainder were foreigners, or Japanese.

The technical experts for the General Ceramic Jury were also selected from the members of the American Ceramic Society. They are Messrs. Binns, Orton and Geijsbeek, although the latter two were unable to serve.

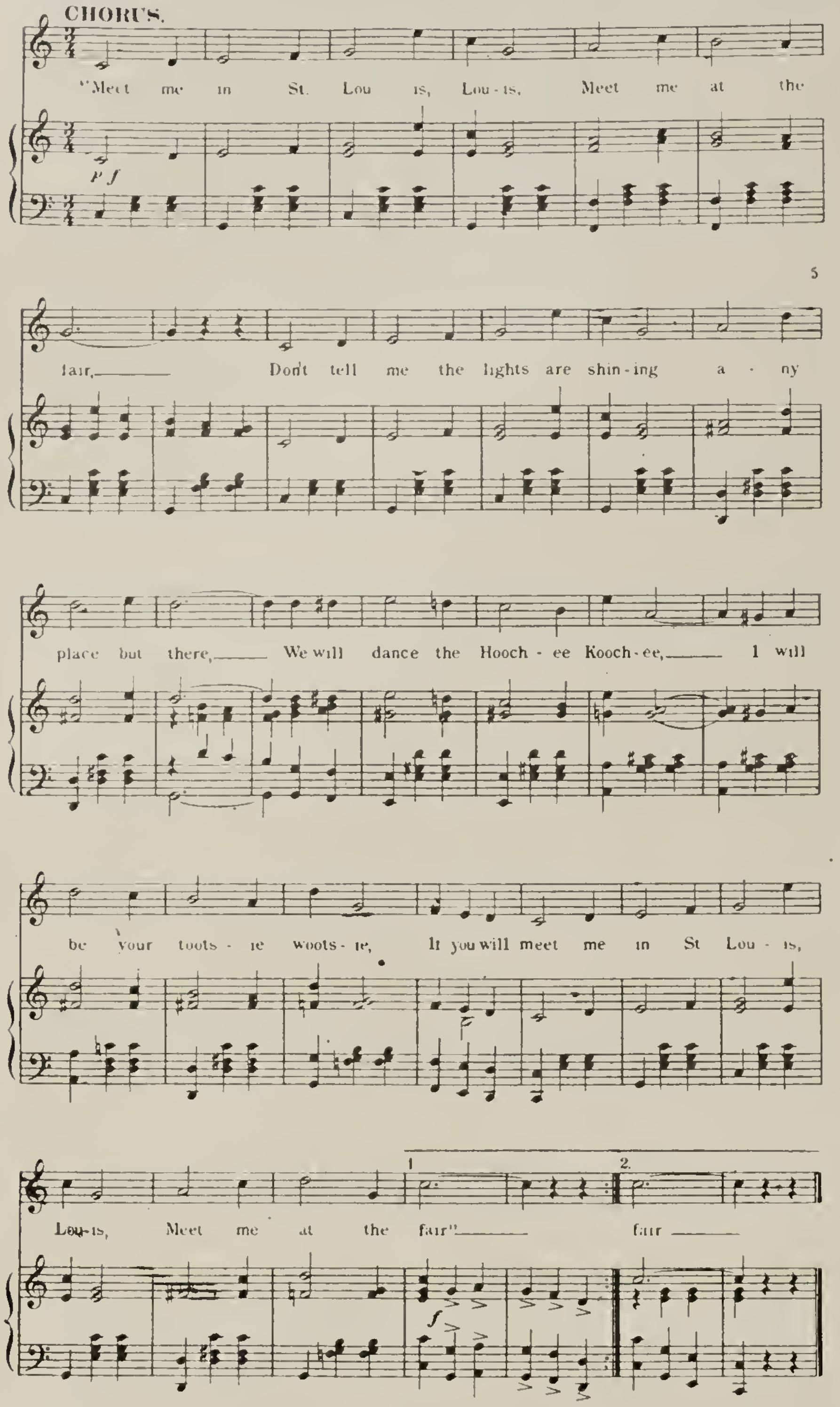
Register of the members of the American Ceramic Society at their meeting at St. Louis World's Fair, September 5th to 10th, 1904. Edward Orton, Jr., Columbus, Ohio; Heinrich Ries, Ithica, N. Y.; Joseph Hyde Pratt, Chapel Hill, N. C.; Elsworth Ogden, Columbus, Ohio; H. A. Wheeler, St. Louis, Mo.; W. W. Taylor, Cincinnati, Ohio; S. Geijsbeek, St. Louis, Mo.; W. D. Richardson, Columbus, Ohio; William D. Gates, Chicago, Ill.; Ira A. Williams, Ames, Iowa; T. A. Randall, Indianapolis, Ind.; Wm. L. Ellerbeck, Salt Lake City, Utah; R. K. Bowman, Trenton, N. J.; W. J. J. Bowman, Trenton, N. J.; C. Louis Whitehead, Trenton, N. J.; Ellis Lovejoy, Columbus, Ohio; F. W. Walker, Beaver Falls, Pa.; I. Mandle, St. Louis, Mo.; R. F. Grady, St. Louis, Mo.; Mrs. Benigna G. Kalb, Columbus, Ohio; Walter M. Fickes, Pittsburg, Pa.; Adolph F. Hottinger, Chicago, Ill.; Julius J. Koch, Chicago, Ill.; Charles F. Binns, Alfred, N. Y.; Heuri de Luse, Limoges, France; Ingenieur Bohumil, Belada, Prague; W. J. Volz, St. Louis, Mo.; A. D. Jones, St. Louis, Mo; H. C. Peffer, St. Louis, Ill.; R. D. Hatton, St. Louis, Ill.; F. Talbot, St. Louis, Ill.; Otto Hensel, St. Louis, Ill.; Edward C. Stover, Trenton, Ill.; Dr. W. Pukall, Bunzlau, Germany; S. G. Burt, Cincinnati, Ohio; Lemon Parker, St. Louis, Mo.

When you have a little spare time, why not spend it visiting your competitor? A visiting acquaintance of this kind is worth having at all times, and it comes in especially handy when some shrewd buyer wants to play one of you against the other.

MEET ME IN ST. LOUIS, LOUIS!

CHORUS:

Meet me in St. Louis, Louis, meet me at the Fair,
I'll look for you October third, when brickmakers will be there.
Professor Wheeler will be our spieler when we do the Pike,
So pack your grips brickmakers, and to St. Louis hike!


CHORUS.
"Meet me in St. Lou-is, Lou-is, Meet me at the
pf
5
fair, Don't tell me the lights are shin-ing a-ny
place but there, We will dance the Hooch-ee Kooch-ee, I will
be your toots-ie woots-ie, If you will meet me in St. Lou-is,
Lou-is, Meet me at the fair"
fair
1.
2.
f

Courtesy of F. A. Mills, 48 West 29th St., N. Y., from whom the complete score can be obtained.

NEWS NOTES.

A. Krebs has engaged in the brick manufacturing business in Sherwood, Oregon.

The Smith County Brick Company, of Tyler, Texas, suffered a considerable fire loss recently.

The Johnson Brick, Tile and Cement Company has been incorporated in St. Mary's, Kansas.

W. J. Carter & Son, 715 Locust street., Butler, Pa., advise us that they are in the market for sand-lime brick machinery.

The plant of the Big Four Clay Company, St. James, Ohio, has been sold by the receiver, and has been dismantled and torn down.

The Mt. Gilead Pottery Company's plant, of Edison, Ohio, was completely destroyed by fire. They carried good insurance but their loss in spite of this amounted to $8,000. They advise us that they will rebuild and so are in the market for new machinery and appliances.

The Athens (Pa.) Brick and Stone Company writes that they are equipping their new plant with machinery from the shops of E. M. Freese & Co., Galion, Ohio. They have ten acres of fine shale that they will utilize in the manufacture of brick and will also quarry a superior quality of blue stone.

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I HAVE NO brickmaking troubles of my own now, but, as the woman said about babies, "I've had 'em, and I know."

Tell me your troubles. I have knowledge and experience for sale. That's all.

WILLARD D. RICHARDSON,
Consulting Engineer to the Brick Industry.
See pages 292 and 296.

WANTED, FOR SALE, ETC.

FOR SALE—Two Bechtel's Rapid Brick Handling Trucks. New, never used. Address
9 1 c "D," Care Clay-Worker.

WANTED.

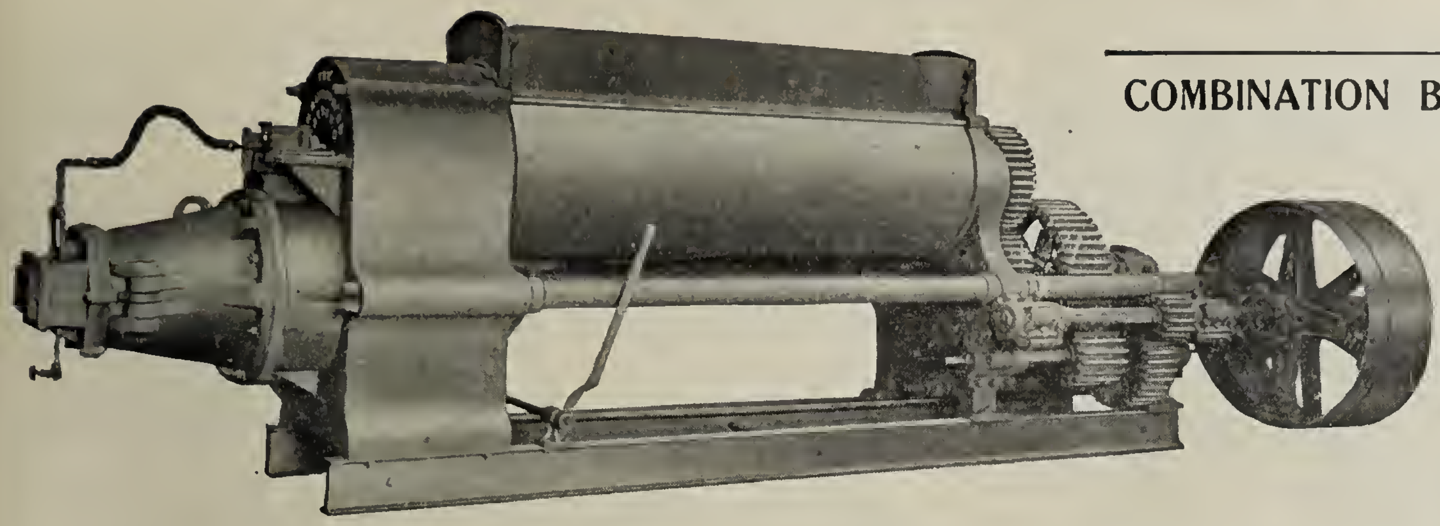
One second-hand four-mold Boyd Brick Press in good condition. Address
SALISBURY BRICK CO.,
9 1 c Salisbury, Md.

WANTED—Position by man who understands the bodies and glazes for earthenware, china, electric porcelain, bricks, tiles, etc. Only those intending business need apply. Address
9 1 cm BENT, Care Clay-Worker.

FOR SALE.

A well equipped machine brick plant. Capacity 20,000 per day. For further particulars write
MRS. IRA GILBERT,
9 3 d Box 75, Fort Calhoun, Neb.

For Sale, Wanted, Etc., Ads Continued on Pages 286 and 287.



COMBINATION BRICK MACHINE

THE

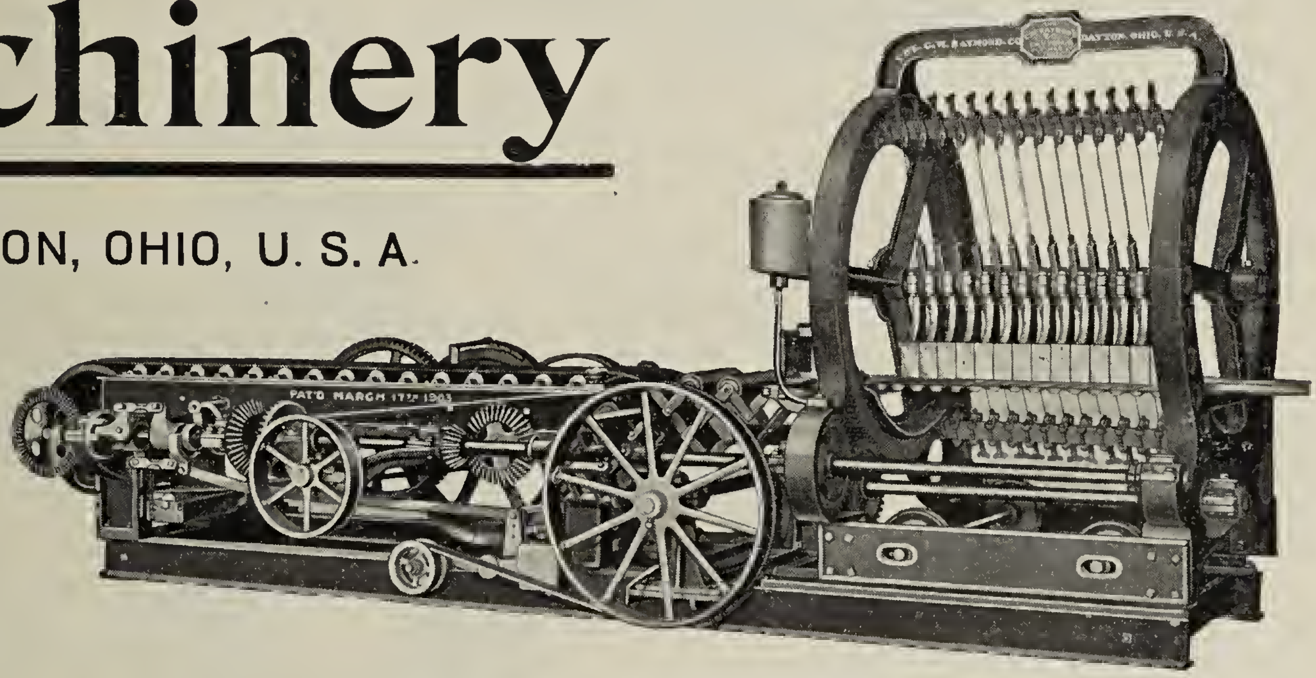
C. W. RAYMOND CO.

Clay-Working

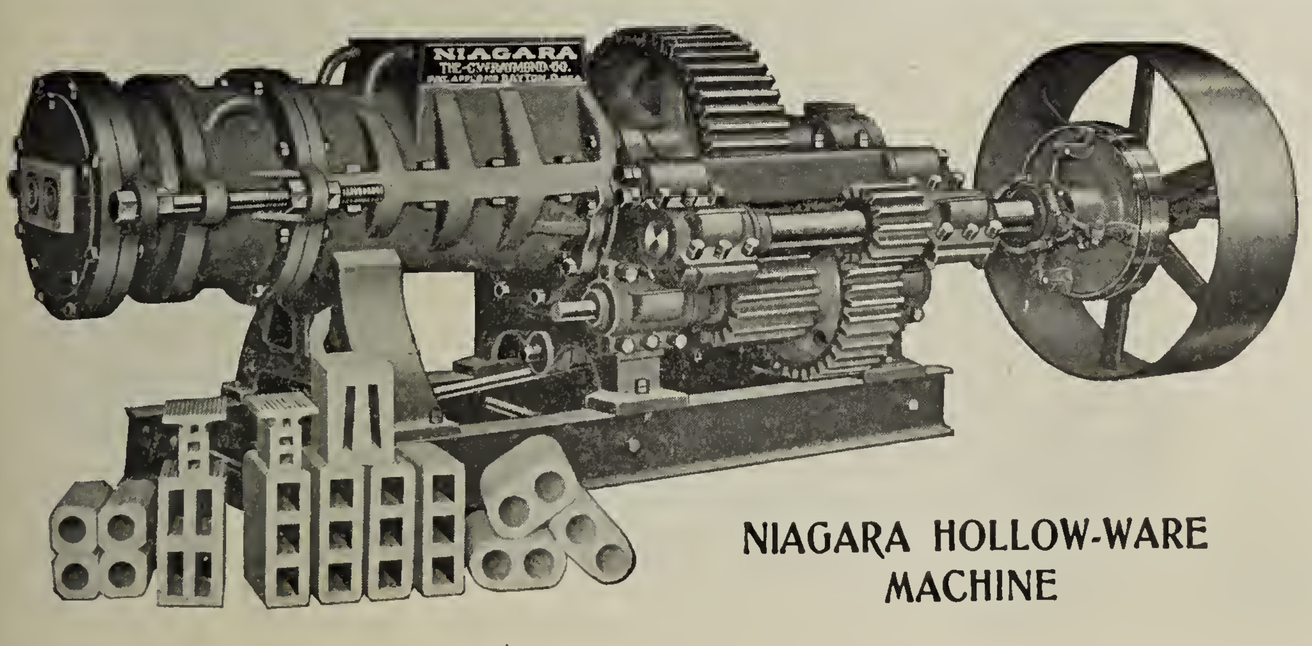
Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street
ST. LOUIS
315 Frisco Building
PITTSBURG
1425 Park Building



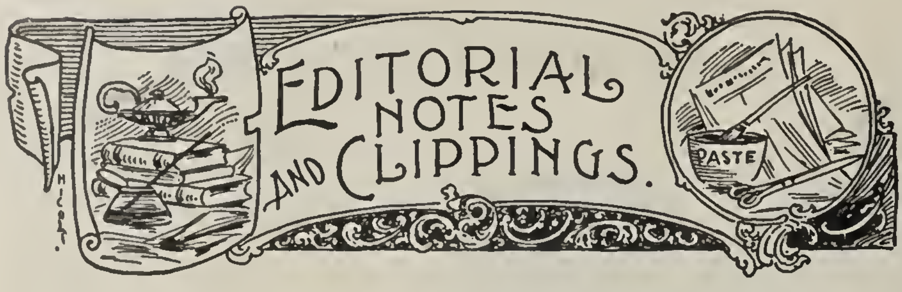
AUTOMATIC DOWN-CUT CUTTER



NIAGARA HOLLOW-WARE MACHINE

Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE



EDITORIAL NOTES AND CLIPPINGS.

Chidester, Ark., wants a new brickmaking plant.

Stanton, Neb., is to have a new brickyard, to be owned by Carl Strachle.

The brickyard of Schumer & Co., Sturgis, N. D., was destroyed by fire last month.

The Lewiston Brick and Supply Company will build a plant of 30,000 daily capacity at Lewiston, Pa.

J. A. Pierce & Son and J. H. Stennis have organized a $10,000 brick and tile company at Mathiston, Miss.

The Venton Brick and Tile Company has been organized at Venton, Ohio, with $15,000 capital stock.

The Johnson Brick, Tile and Cement Company has been incorporated at St. Marys, Kansas, with $40,000.

The Huntingburg (Ind.) Clay Works have been incorporated by M. M. Nelis, J. W. Lewis and H. S. Rothert.

Charles E. Metcalf has purchased the brickyard of S. F. Fuller at Kennebunk, Me., and will operate same in the future.

The Kelly Brick and Tile Company's plant at Wrenshall, Minn., was burned recently. The loss is estimated at $8,000.

The Edgington Clay Company, Portsmouth, Ohio, has been organized to develop an immense tract of clay in southern Ohio

Frank M. Cross and E. G. D. Haggerty, of Lafontaine, Ind., have organized the Lafontaine Brick Company, with $10,000 capital stock.

Christian Voelker, a pioneer brick manufacturer of Columbus, Ohio, died at his home in that city in his seventy-third year. He leaves one daughter.

The Adams Bros. Brick Company has purchased twenty-five acres of fine clay land at Bristol, Tenn., on which they will erect a modern brickmaking plant.

The plant of the Denver (Colo.) Fireclay Company was damaged to the extent of $5,500 by fire recently. Several firemen were seriously injured by the explosion of chemicals.

C. H. Carpenter, secretary of the Suburban Brick Company, Wheeling, W. Va., dislocated his ankle while playing tennis recently, and as a result will be confined to his home for some weeks.

The Wellston Brick and Tile Company has recently equipped their plant at Wellston, Ohio, with modern machinery, and they are now turning out a very fine grade of building brick and drain tile.

In renewing his subscription, W. T. McGowan, Kipling, Ala., says that the demand for brick in and around Mobile has never been better. They are scarcely able to fill the demand at $8.00 to $8.50 per thousand.

Wm. A. Perry, an employe at Sargent's brickyard at Painesville, Ohio, was so badly injured by being caught in a cave-in of the clay bank that he died within a few minutes after being taken out. He left a widow and three small children.

There was a small but disastrous fire at A. C. Ochs' brickyards at Springfield, Minn., recently, which completely consumed the pumping house at the river, entailing a loss of about $300 besides causing the closing down of the entire plant for a few days.

Among the brick manufacturing enterprises established in Wisconsin this season is that of Sesvold & Olson, at Galesville. The plant is modern in every respect and was constructed after plans made by Chisholm, Boyd & White Co., who also furnished the machinery, including a 97 model Boyd brick press. These people have good clay and are turning out first-class brick.

The Spahr Pressed Brick Works, Maysville, Ky., of which Col. A. C. Spahr, an old-time brick manufacturer, is president, have just completed their new brick plant, which will be devoted exclusively to the manufacture of high-grade front press brick, from an excellent quality of clay, which they have in abundance. The plant was erected under the able supervision of the superintendent, Mr. H. S. Howland, a well-known brickmaker. The complete equipment of brickmaking machinery, which includes a 97 model Boyd brick press, was furnished by Chisholm, Boyd & White Co., of Chicago.

The Mississippi Sand Brick Company has been chartered to manufacture sand-lime brick at Jackson, Miss.

Adams Brothers Brick Company, Bristol, Va., has just purchased a large tract of fine clay land on which they will erect a large brick plant.

W. Phillips, Bowling Green, Ky., in renewing his subscriptions, says, "THE CLAY-WORKER is worth a great deal more than the price of the subscription."

M. F. Rushfeldt has bought a forty-acre tract of land at Albert Lea, Minn., containing a deposit of excellent clay and will erect a brick, tile and sewer pipe factory.

The Bond-Sandstone Brick Company has the new plant at Jacksonville, Fla., in operation, turning out 20,000 sand-lime brick daily. They have already booked a large number of orders.

The New Albany (Miss.) Brick and Tile Company has been chartered. N. Fitzpatrick, J. T. Baker, Z. M. Stephens and others are interested. They have $25,000 capital stock.

The Robinson Clay Product Company, of Akron, Ohio, has been incorporated with $10,000 capital stock, by B. N. Robinson and F. W. Butler, of Akron, and L. I. Foster, of New York City.

The Metropolitan Paving Brick Company, Canton, Ohio, has been incorporated by H. G. Renkert, C. W. Keplinger, James H. Barbour, Jacob J. Renkert and George R. Shuane. They certify to $1,000,000 capital stock.

Articles of incorporation have been filed by the Chatham Brick Company of New York City. The incorporators are L. R. Walker, Tarrytown, and Henry and Felix Blum, of New York. Capital stock $100,000.

The Knowles, Taylor & Knowles Pottery Company, East Liverpool, Ohio, has commenced the manufacture of its famous lotus ware, which it abandoned nearly ten years ago on account of the expensiveness of manufacture.

The plant of the Cambria Brick Company, Cambria, Md., has been sold to the Baltimore Brick Company, Baltimore, Md., for $20,000. Mr. P. Johnson, a member of the old firm, will have charge of the plant for the new owners.

The West Seneca Brick Company has filed articles of incorporation at Buffalo, N. Y. The directors of the company are L. D. Wood of Buffalo and Thomas D. Barret and I. C. Darling of Cleveland, Ohio. The company is capitalized at $5,000.

The Malakoff (Texas) Vitrified Brick Company has had a very busy and prosperous season. They have had to turn their energies toward the making of a new face brick altogether, and even then they have hardly been able to supply the demand.

The new plant of the Delton (Mich.) Brick Company, which was started early in the summer, has been kept running steadily turning out 50,000 brick per day, all of which have been sold at a good price, and the success of the venture is fully assured.

September 3rd the plant of the Kanawha and New River Firebrick Company, Charleston, W. Va., was destroyed by fire which started in the dryer. The loss is estimated at $40,000. The plant had been in operation two years and was complete throughout. It will probably be rebuilt.

The famous historic city of Gettysburg (Pa.) has a modern press brick plant, owned and operated by the Gettysburg Brick Company, Martin Winter, manager. The four-mold special Boyd brick press, made by Chisholm, Boyd & White Co., was purchased and installed by this company.

Among the new brick plants started in the Southwest this year is that of the Blumberg Brick Company, C. F. Blumberg, manager, Seguin, Texas. The four-mold Boyd special, manufactured by Chisholm, Boyd & White Co., Chicago, is used at this plant, which is a model one in every respect.

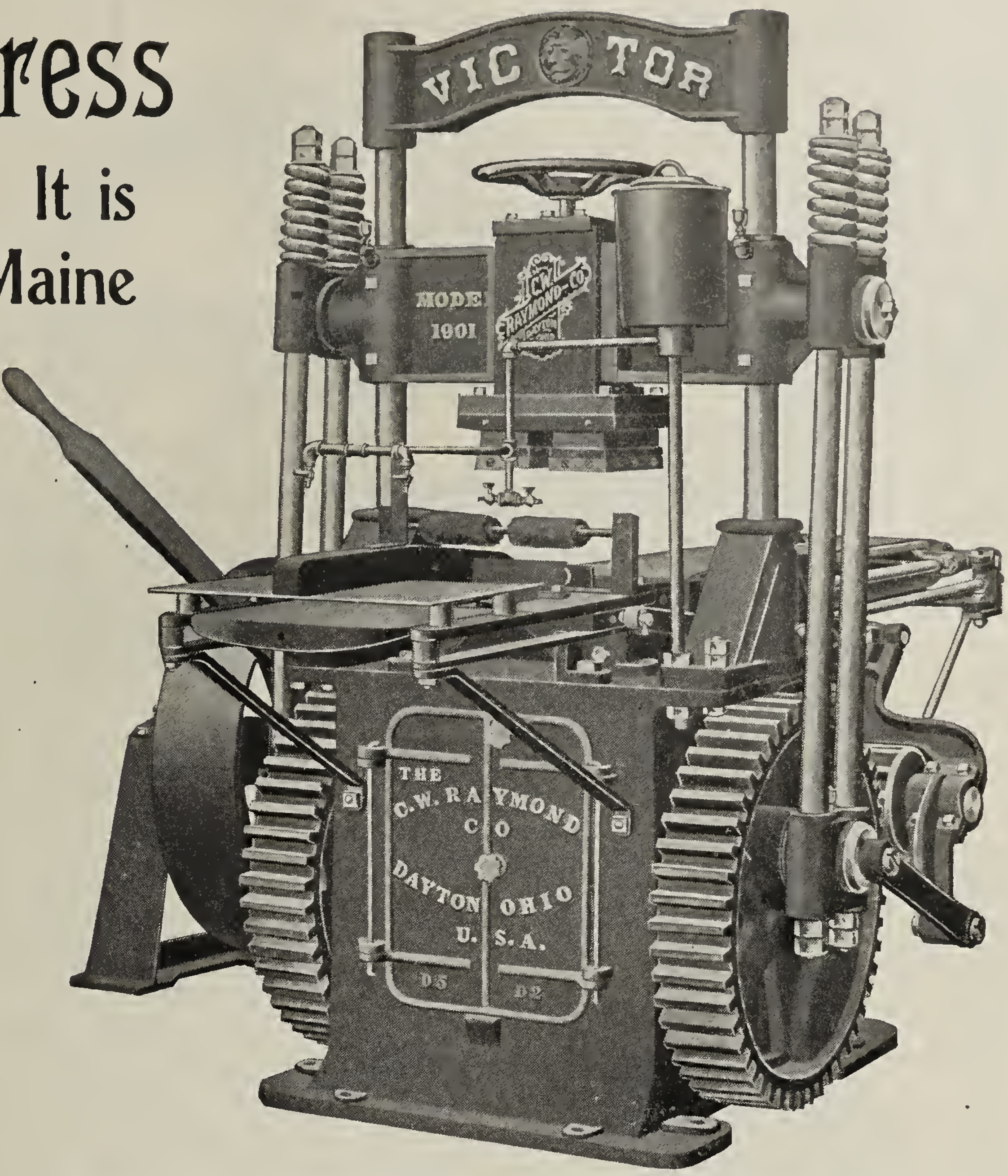
The Kleymeyer & Kluty Brick Company, Henderson, Ky., has had an unusually busy season. They have just booked one order for a half million brick. They have a daily output at their Henderson plant of 55,000 brick and in addition to this have branch plants at Louisville and Evansville, Ind., both of which are also running full time.

R. W. Campbell, of the pottery firm of Robert Campbell & Sons, Hamilton, Canada, died suddenly, August 29th. A broken blood-vessel in the head was the cause of death. The deceased was one of the best-known residents of the West End, and since the death of his father has, with his brother, Colin C., carried on the business of R. Campbell & Sons. He was 53 years of age,

[CONTINUED ON PAGE 280.]

The Victor Re-Press

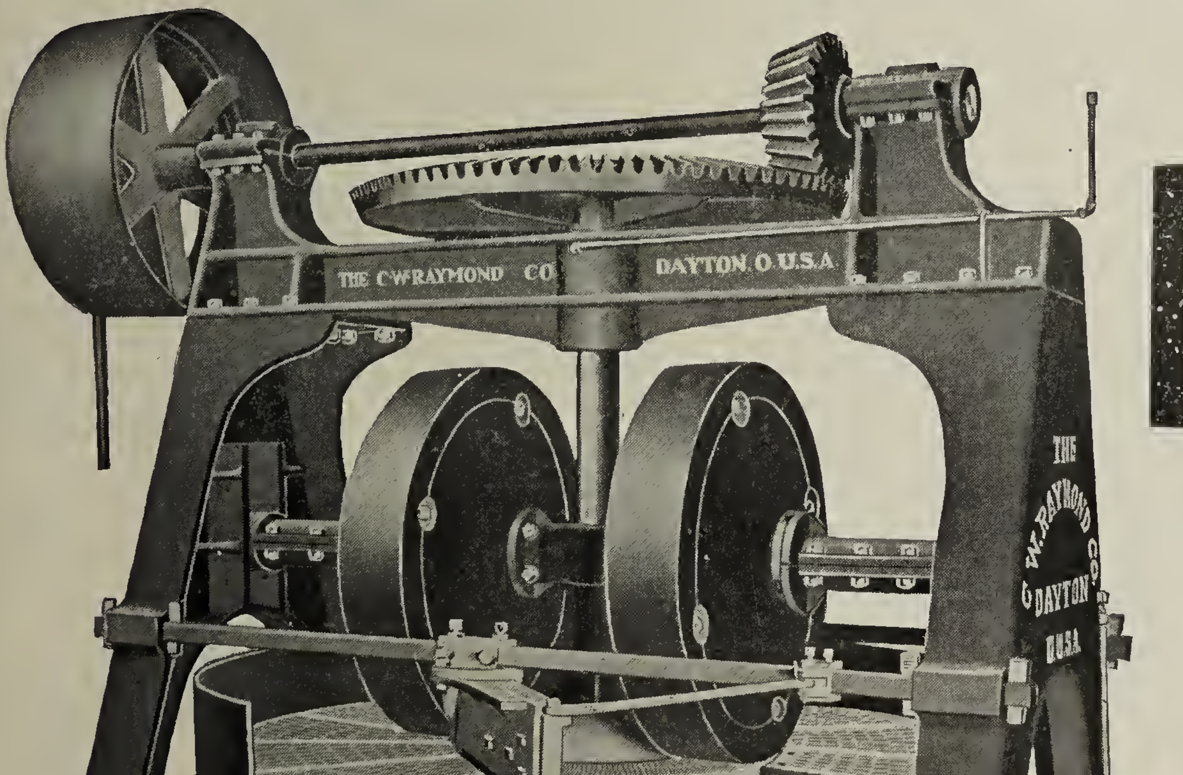
needs no introduction. It is known and used from Maine to California, ⁕ also, somewhat in Europe, Asia and Africa.



Our Dry Pan

has more crushing power, and more screening surface than other pans--heavier too

Investigation will Prove it.


THE C.W.RAYMOND CO
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Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street

ST. LOUIS,
315 Frisco Bldg.

PITTSBURG,
1425 Park Bldg.

EDITORIAL NOTES AND CLIPPINGS—Continued.

and was born in Elizabeth, N. J. A widow and six children survive him.

The St. Paul (Minn.) Brick Company has been organized by Wm. C. Reed and others. They will at once erect a modern brickmaking plant.

The National Brick and Construction Company of Omaha, Neb., has been incorporated with $750,000. A. J. Myck, E. T. Pumphrey and J. M. Ellingsworth are interested.

Articles of incorporation have been filed to the Clay Products Company, of Trenton, N. J., with $50,000 capital stock. The incorporators, John, W. B. and K. Thines, are all residents of Trenton.

The Hyatt Brick Company has been incorporated at Columbia, S. C., by F. H. Hyatt, of Columbia, and J. H. Rogers, of Union, S. C. The company will manufacture brick, tiling, piping and other clay products.

Parties looking for good second-hand machinery, dryer and equipment, will do well to read the advertisement of the Superior China Clay Company, of Chippewa Falls, Wis., in our "Wanted, For Sale," etc., department.

T. J. Neiswanger, proprietor of the Harvey (Iowa) Brick Company, is making a number of improvements at the plant, installing modern machinery, and will in the near future turn out a very superior grade of brick and tile.

The Tampa (Fla.) Sand-lime brick Company's plant is being equipped with machinery and appliances furnished by the American Sand-Lime Brick Company, and will soon be ready for business. They will have a daily capacity at the outset of 20,000 brick per day.

The Aregood Construction Company, Chicago, Ill., has just installed their electric clay handling system, which was described in the July CLAY-WORKER, at the Calumet yard of the Chicago Brick Company, and expect to lower the expense of transporting the clay from shovel to plant to $12 per day.

J. A. Blackburn, president and one of the stockholders of the B.-K. Enamel Brick Company, Warren, Ohio, has filed suit asking for the appointment of a receiver, declaring the concern to be insolvent. Mr. Blackburn says the company's assets are $15,000 and the liabilities over $20,000 outside of the capital stock.

The Calhan Fire Clay Manufacturing Company have filed articles of incorporation. The company is capitalized at $1,000,000 and the incorporators are Marcus A. Bettman, Theodore Marx, Ethelbert Ward, Charles M. Maliphant and A. J. Spengel The clay beds are in El Paso county and the principal offices and plant will be in Denver, Colo.

The Utah Fireclay Company, T. R. Ellerbeck, Manager, Salt Lake City, Utah, has recently built a new and modern brick plant for the manufacture of firebrick and press building brick, and the machinery is now being installed, which consists of a two-mold special Boyd brick press and other machinery, furnished by Chisholm, Boyd & White Co.

Ralph Veneklasen, president and manager of the Zeeland Brick Company and president of the Holland Sugar Company, died this morning at his home in Zeeland, Mich., September 3rd. He was forty-eight years old, and prominent in church and business circles. He was one of the eight Veneklasen brothers, of whom five are now living. Mr. Veneklasen is survived by his widow, four daughters and two sons.

Fire, which broke out about 4 o'clock on the morning of September 10th in the brick plant of the Harbison-Walker Company, in West Homestead, Pittsburg, Pa., resulted in the death of one man, the injury of two others, and caused a loss of about $25,000, nine buildings being destroyed before the fire could be got under control. The fire started in one of the boiler rooms. The men who were injured belonged to the local fire department.

W. H. Mahan, president and general manager of the Coffeyville (Kansas) Vitrified Brick and Tile Company, died August 27, at St. Joseph's hospital, Kansas City. Mr. Mahan was one of the wealthiest and most prominent citizens of Coffeyville. He leaves a widow and seven children. Bright's disease caused his death. Besides his connection with the brick company, he was a director in the Condon National Bank, and one of the largest property owners in Coffeyville.

The powder magazine belonging to the Savage Firebrick Company, at Williams, Pa., and which contained a considerable amount of powder and dynamite, was blown up about 9 a. m. on Saturday, August 25, by unknown parties. The shock caused by the explosion was felt for miles around, and considerable damage was done to property in and about the village of Williams. The front of the store building, which is owned by J. J. Hoblitzell, was entirely demolished. A mule belonging to the company was killed.

The machine shop and engine room of the Dillehay Brick Company, Danville, Ky., were destroyed by fire September 2, causing a loss of $3,500.

The Atlas Brick Manufacturing Company is the name of a new concern recently incorporated at Denver, Colo., with $50,000 capital, by H. R. Brown, A. J. Senior and F. M. Keezer, all of Denver.

The plant of the Smithe County Brick Company, near Lindall, Texas, was completely destroyed by fire, August 22nd. The fire is supposed to have been of incendiary origin. The loss is placed at $8,000 to $10,000.

The Williamsport Brick Company is the name of a new concern at Phillipsburg, Pa. The company has been incorporated by Joseph Barnes of Phillipsburg and Edward B. Read and John Mason of Clearfield, Pa., with $60,000. They will manufacture both brick and tile.

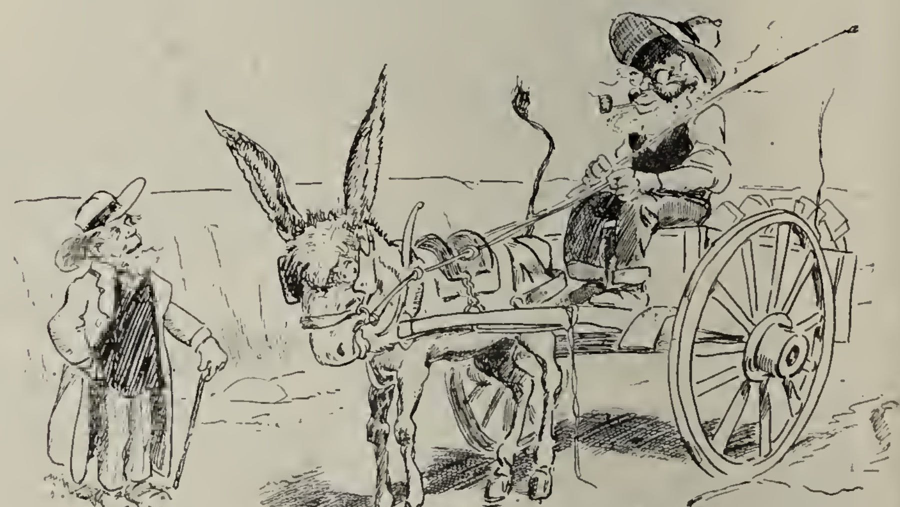
The new brick plant of the Nashville Press Brick Company, Nashville, Ill., is now in operation and turning out a first-class quality of brick. The plant was erected after designs of Chisholm, Boyd & White Co., of Chicago, who also furnished the brickmaking machinery, which includes a four-mold Boyd brick press, special.

The Fertile Brick and Tile Company, Fertile, Minn., has had a very prosperous season. Mr. George Kronchnabel, the manager of the company says that the people in his section of the state are fully awakened to the advantages of tile drainage and consequently the outlook for a continued season of prosperity for their drain tile department is very good.

The Portland Brick & Tile Company, of Portland, Ore., recently made and burned a kiln of brick with excellent results. This company lately purchased and installed a complete outfit of press brick machinery, in which was included a four-mold 97 model Boyd press, dry-pan, etc., furnished by Chisholm, Boyd & White Co. Mr. James Anderson, who is well known on the Pacific coast as a brick manufacturer of large experience, came East and selected this machinery after a personal examination and investigation.

The Johnsonburg (Pa.) Vitrified Brick Company under the able management of Henry Hasbrouck, has had a most prosperous season. A number of improvements have been made in the plant until it is one of the best in that section. A new Richardson repress has recently been installed, and other machinery will be added as the need for same arises. All the pavers on hand are sold and they have enough orders now on file to keep the plant running full handed to the end of the season. They are now shipping from eight to ten cars of brick every day.

David Murtha, senior member of the brick manufacturing firm of Murtha & Early, Philadelphia, died yesterday at his home, No. 5912 Ridge avenue, Roxborough, of heart disease, age 70 years. He was born in Philadelphia and in his early life he learned the business of brick making, in which he was engaged in various localities during his entire life. He was also prominent as a building operator in Tioga and other parts of the city. He took an active part in Republican politics in the Twenty-eighth ward and served one term in the Sectional School Board. His wife, a son and daughter survive him.



APPROPRIATE.

"Why do you call your mule 'Golf'-ball, uncle?"

"'Cause yo' hab ter hit him so blame hahd ter drive him enny distance, sah." —Judge.

OVER
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"Monarch"
Brick
Machines
in use.

OVER
500
"Quaker"
Machines
in use.

WRITE
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regarding
Disintegrators,
Pug Mills,
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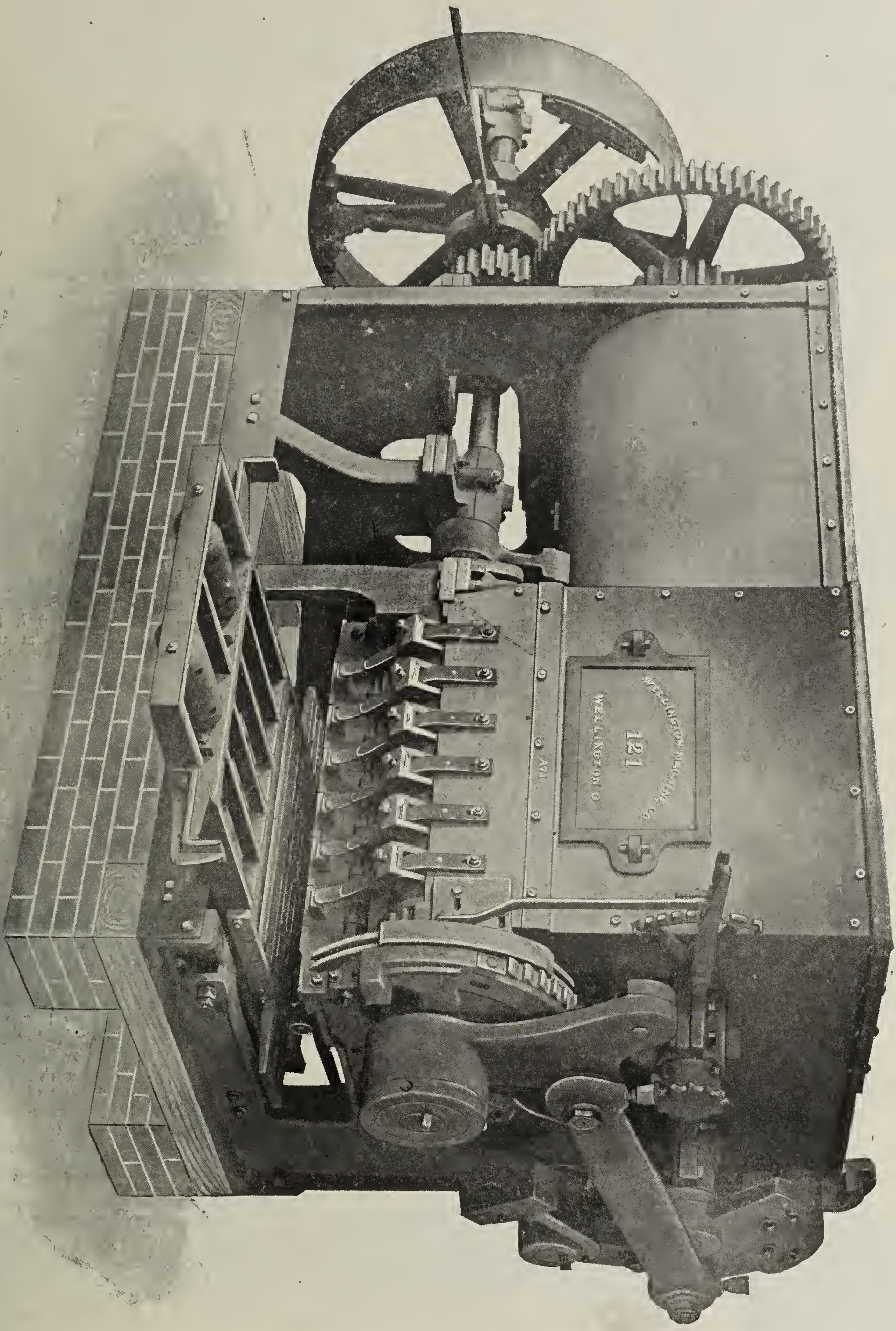
Winding
Drums,
Dump Carts,
Elevators,
Dump Tables
and all
kinds of
Kiln
Castings.



The "Big No. 6" "Monarch" Brick Machine.

REMEMBER:
You are losing money wheeling brick unless you have our
ROLLER-BEARING BARROWS.

The Wellington Machine Co.,
WELLINGTON,
OHIO.

Send for Catalogue.

Written for THE CLAY-WORKER.

PACIFIC COAST NEWS.

BUILDING OF ALL SORTS seems to hold up remarkably well in San Francisco and vicinity, notwithstanding some adverse conditions in general trade. Brick men report that the season has been fair and, on the whole, will compare well with last year. A good deal of work is now under way and enough in sight to keep the brick men busy for a month or two to come. Just at present, there is some slight tendency to hold off on new contracts, owing to the uncertainty of prices and to the rumor that there will be some severe cutting before long.

A decision by the California State Supreme Court affirming the validity of the bond issue voted at the election in this city on September 29, 1903, has been received with considerable satisfaction by the trade. The bonds which have been declared valid include an issue of $7,250,000 for a new sewer system, $1,000,000 for a new city and county hospital, $3,595,000 for school houses and playgrounds, $697,000 for a new county jail and for the improving of the Hall of Justice, and $1,647,000 for a new public library building and site. There are some other smaller issues. It is understood that the bonds will be sold at once and that work will shortly begin on a number of the improvement.

The Southern Pacific Railway Company has begun the manufacture of tiles for culvert purposes at its plant at Orland, Cal. It is understood that this work is now considered to have passed the experimental stage.

A. C. Maddox, a pottery man of Sacramento, Cal., spent several days in San Francisco, last week.

J. V. Rose, who is interested in the manufacture of brick at Sharon, Pa., is one of the principal men of the American Magnesite Company, which is preparing to begin operation on the magnesite deposits in the Livermore hills. Mr. Rose will organize the Rose Brick Company and will shortly arrange for the erection of a brick plant in Oakland, Cal. The proposed plant will have a capacity of 100,000 bricks per day. The company will control the American rights for the manufacture of a patent brick and constructing material, the basis of which is magnesite. This material will be used for fireproofing and flooring.

Barnes & Miller, proprietors of the new brickyard at Wilbur, Wash., which was established at that place last spring, has burned one kiln of brick, and the quality of the product is excellent. The proprietors are now burning their second kiln.

The recent experiments of Backley & Holms in the manufacture of brick from sand have proved an entire success. The cubes which were moulded some eight or ten days ago are now as hard as ordinary brick, and as the material of which they are composed will continue to harden from six to eight months, it can readily be seen that by that time they will be as hard as stone. The experiments have been carried on at North Bend, Oregon.

The Ornamental Stone & Brick Company recently organized in Long Beach, Cal., has secured a site for the establishment of its plant on the block between Fourth and Fifth streets, just west of the line of the Salt Lake Railroad, which line is to build a switch into the brick company's property to facilitate the handling of raw materials and the finshed product. Orders have been placed for two of the pressing machines. The capacity of these two machines will be 450 complete bricks each day.

In order to secure a loan of $250,000 a deed of trust has been placed on record at Oakland, Cal., transferring the property of the Carnegie Brick and Pottery Company to the California Safe Deposit Company.

The board of directors of the Sonoma Brick Company has levied an assessment of 5 cents per share upon the capital stock of the corporation, payable immediately at the office of the company, at 310 Pine street, San Francisco. The works of the company are located in Sonoma County, California.

The Stockton Brick Company's plant on Roberts Island, Cal., is newly fitted up with improved machinery and other equipments. There are four large drying sheds, and everything has been placed in condition to conduct a big business.

The Palous Pottery Company, of Palouse, Wash., intends to enlarge its plant.

The Sunset Brick and Tile Company, of Santa Monica, Cal., and the Pressed Brick Company of Los Angeles, Cal., have consolidated, and are under new mangement. The two concerns will be operated separately as before and only the financial interests will be combined. The plant at Santa Monica will be enlarged and improved by the addition of $30,000 to $50,000 worth of new machinery. The Los Angeles corporation has increased its capital stock from $250,000 to $350,000. The officers of the Los Angeles corporation are: Charles H. Fort, president; W. C. Patterson, vice-president; West Hughes, secretary, and Henry Obee, superintendent. The stockholders of the Sunset Company who are now interested in the consolidated stock, are E. P. Clark, Robert F. Jones, W. T. Gillis, J. H. Spires and C. H. Sweet. The Santa Monica plant is at present filling an assignment of 600,000 bricks for Los Angeles storm sewers.

John W. Pohle, of the City of Mexico, Mex., has secured an option on the Dorner & Baemeister sand-lime brick plant until the middle of September. It is the intention of Mr. Pohle to go to the United States in the near future and endeavor to organize a company for the purchase and operation of the plant.

F. J. Lease, of the Stockton Brick Company, Stockton, Cal., announces that his company has withdrawn from the brick combine. The combine price of brick in Stockton has been $10 per 1,000, with a commission of 50 cents added for the seller, making the cost of building material $10.50 per 1,000; but the Stockton Brick Company has cut the combine price to $8 per 1,000, and if the plans of Mr. Lease are carried forward, the regular price of first-class Stockton brick will be $7.50 per 1,000. Mr. Lease has added the latest improved machinery to his plant and has a kiln that will turn out 25,000 finished brick every day. The clay beds at the Stockton Brick Company's plant cover forty acres and are from twenty to thirty feet in depth. The brick-making machinery will turn out from 40,000 to 50,000 green bricks in a day, and the sheds have been erected to continue the burning process throughout the wet months, so the plant can turn out 25,000 brick every day in the year.

The Diamond Brick Company on August 23rd made its first shipment of drain tile and terra-cotta from the new tile factory which this company has added to its brick plant at Vancouver, Wash. The tile was loaded on a scow and brought to Portland, Ore., where it was sold. SUNSET.

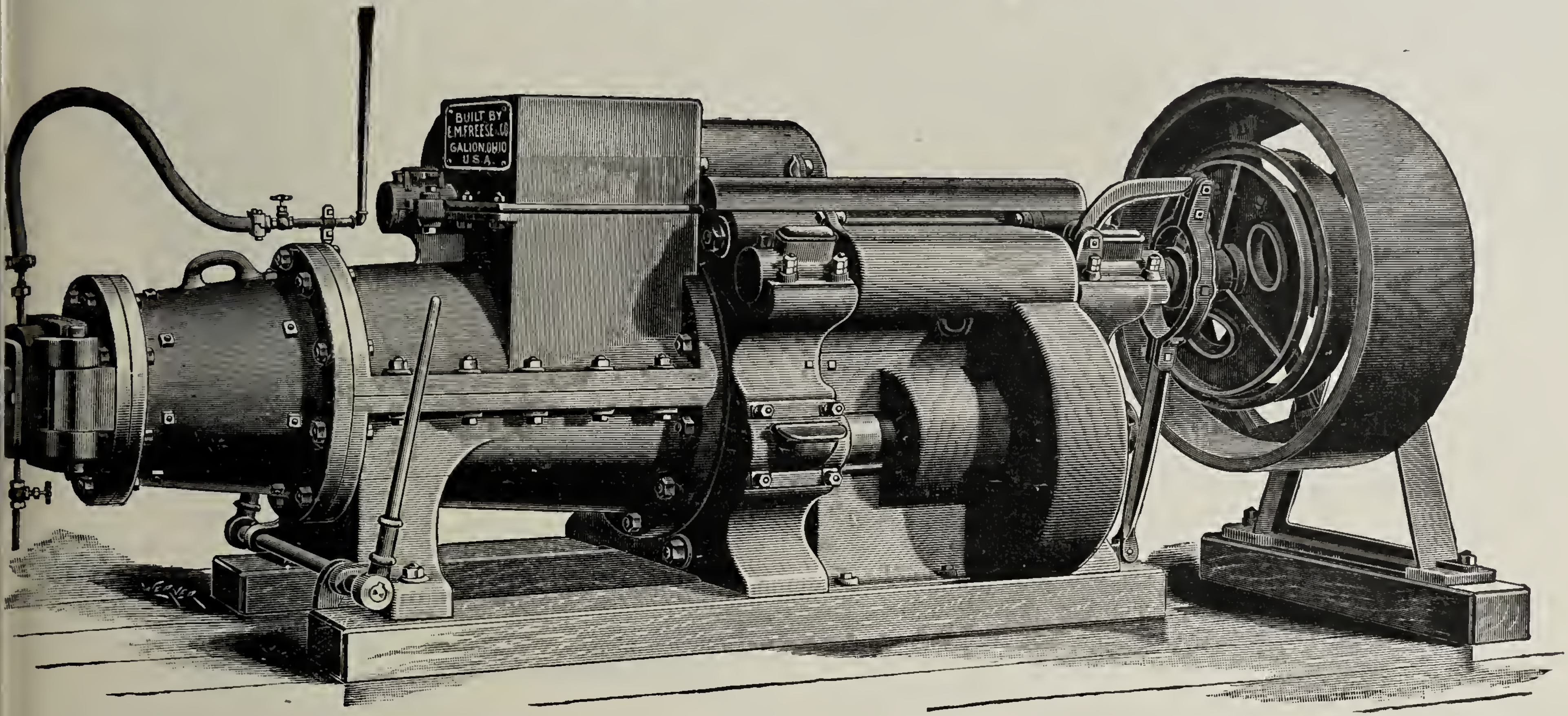
San Francisco, Cal., September 5, 1904.

ALPHA CANVAS BELTING.

is the only one which will not stretch more than high-grade leather—which will not harden in cold weather—which will stand a strain of 1,400 pounds to each inch of four-ply.

THE AMERICAN BELTING CO., YOUNGSTOWN, OHIO.

Our Mammoth Brick Machine


BUILT BY
E.M.FREESE & CO.
GALION, OHIO
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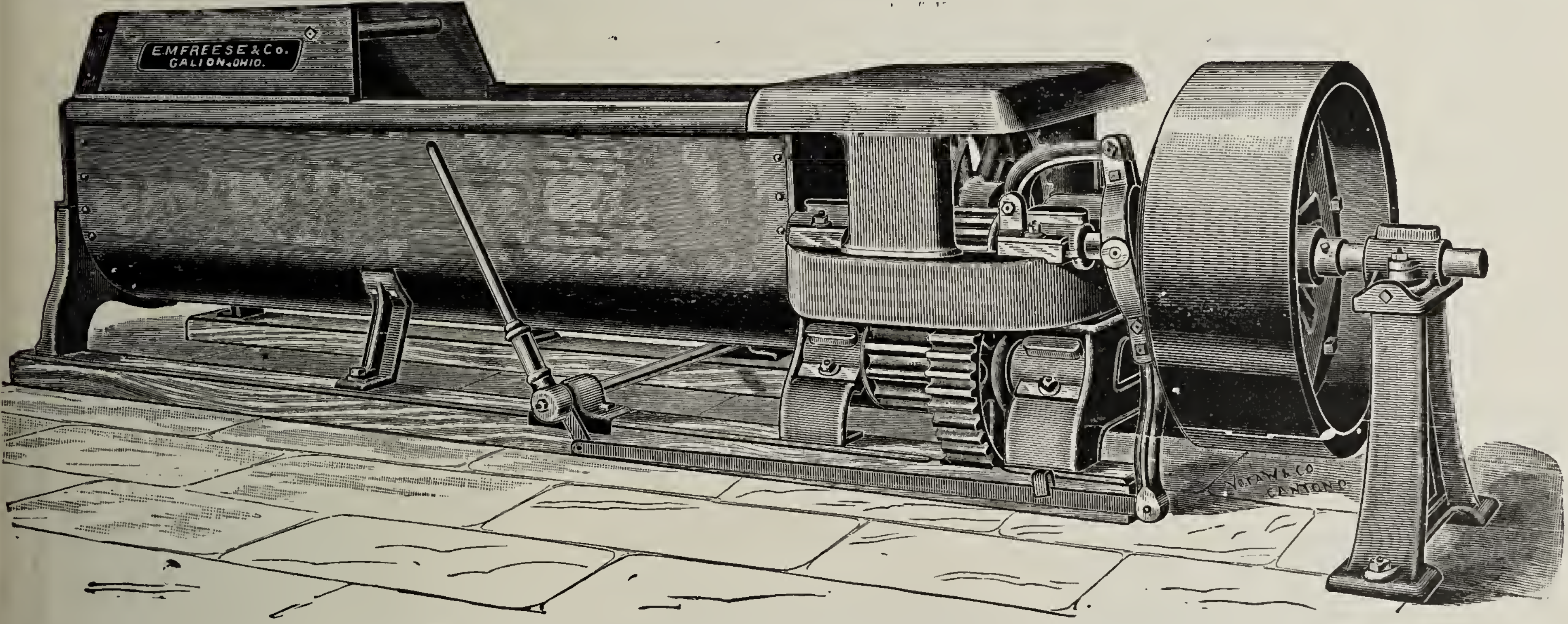
THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

* * *

Our Pug=Mills Have Features of Great Merit.


E.M.FREESE & Co.
GALION, OHIO.

THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 320 and 321.

TITANIC ACID IN CLAYS.

MR. GEORGE VOGT, technical director of the National Manufactory at Sevres, writing in *La Ceramique*, says that it has been known for a long time that titanic acid is frequently present in clays, and statements of the quantity have been published. As long ago as 1862 Edward Riley gave, in the journal of the Chemical Society, analyses of clays in which the contents of titanic acid varied from 0.5 to 1.0 per cent. and even one clay, from Wiltshire, which showed 2.19 per cent. As a rule, though, the greater number of chemsits neglect the presence of titanic acid in clays. Seger gives the reason for this when he says: "The fact is that titanic acid is very often present in only small quantities in clays, and the difficulty and tediousness inseparable from the determination of the quantity of this acid is the cause of its not being noted in most clay analyses, although a great number of clays contain it."

Nevertheless, Seger very seldom gives the quantity of titanic acid in the clays he investigated. Bischof, in a compilation of 522 clays and thirty-three bauxites, does not give more than a dozen clays as containing titanic acid. In the European clays the percentage varied between 0.10 and 0.59, and in the bauxites between 1.24 and 2.63. Among the 120 analyses of American clays in Bischof's compilation only fourteen show the presence of titanic acid. The quantities are given as varying between 0.55 and 2.94 per cent. In one case it is even stated to be 4.62 per cent., unless this is a printer's error.

If all the published analyses of clays are considered, we might believe that the presence of titanic acid in them is a very rare exception. I think, if we may judge by the analyses made at Sevres, that Seger was right in assuming that titanic acid is very widely distributed among clays and that if its presence was not noted or determined it was because analysts were unwilling to carry out the wearisome investigation and perhaps also on account of tne little interest formerly felt in this acid.

Yet it is quite easy to find even traces of titanic acid in solution by means of the beautiful and distinct yellow color which the solution shows on the addition of a highly oxygenated water or of sodium hyperoxide. This reaction is so sensitive that titanic acid can be shown when present in all clays and kaolins. In fact, of thirty-seven clays which were analyzed at Sevres, thirty-seven contained titanic acid. Fourteen of these clays were from Nievre, and the percentage of titanic acid (TiO_2) ranged from 0.04 to 1.25. The iron contained in these clays (Fe_2O_3) varied between 0.99 and 18.73 per cent. There does not appear to be any relationship of presence or absence in these two components. The clay containing the largest proportion of iron—18.73 per cent.—had 0.59 per cent. of titanic acid, but another clay with 16.39 per cent. of iron had 1.03 per cent. of titanic acid.

Twelve samples of clays from the department of Seine and Marne showed titanic acid from 0.96 to 2.08 per cent. and iron from 0.53 to 4.05 per cent.

Six clays from the department of the Orne were examined. In two of them the quantity of titanic acid was not determined. In the other four it ranged from 0.21 to 1.80 per cent. The iron in these clays varied between 0.36 and 2.70 per cent.

Two clays from the department of the Midi showed 0.89 and 1.79 of titanic acid, and 7.66 and 0.96 of iron.

A kaolin of Limousin, the ordinary quality, contained 0.16 titanic acid and 1.08 iron.

Two Belgian clays contained respectively 0.55 and 0.31 of titanic acid and 0.52 and 0.74 of iron.

We know from the investigations of Seger that titanic acid has an influence upon the fluxing point of clays. It can be said, too, that it has a powerful influence upon the color of the ware after burning, particularly if iron oxide is present in the clay or kaolin. It is, therefore, very desirable that no clay analysis should be made without showing the quantity of titanic acid contained in it, or, at least, positive information should be given as to whether it is present or absent.

The examination of clays for titanic acid will be of great interest, both for the industry and for science.

SOMETHING NEW
FOR
INDUSTRIES.

THE LEHIGH VALLEY RAILROAD CO.

is about to open a new territory in the New Jersey Clay Belt. Very desirable locations are offered to manufacturers of Clay and Kaolin products. For further information address

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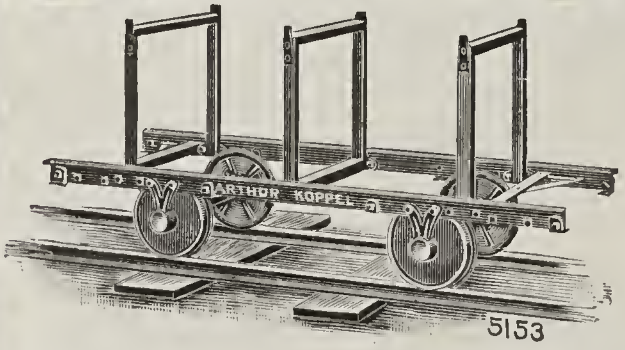


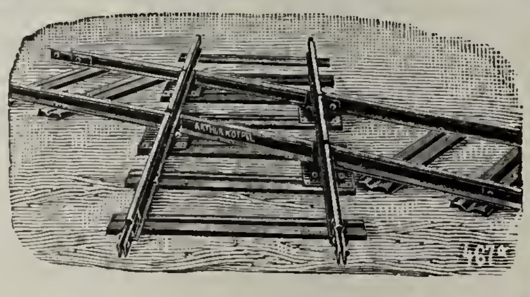
Double Deck Brick Car for Wooden Decks.

Railway Materials
for
Brick Yards.

We furnish everything in the line of railway materials, rails of all weights, track supplies, portable track, switches, frogs, etc.

We also furnish cars of all styles and dimensions, for all purposes, wheels and axles, etc.

We shall always be glad to answer questions, make estimates, give any information and put our experience of more than twenty years at the disposal of friends.



Crossings to Match, or Regular Portable Track.

WE CARRY A LARGE STOCK OF ALL OUR STANDARD MATERIALS.

Arthur Koppel,

Manufacturer of Industrial, Narrow and Standard Gauge Railway Materials.

Catalogue "C" sent on request. **Dept. 3, 66-68 Broad St., New York.**

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

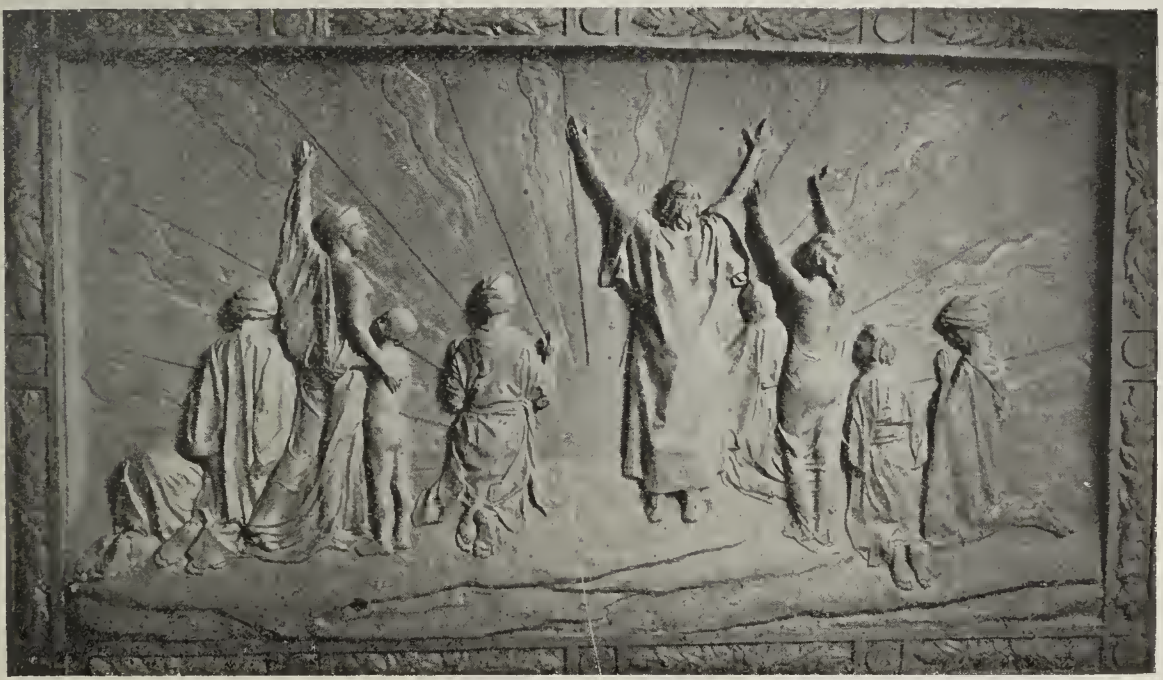
VOL. XLII. INDIANAPOLIS, IND., OCTOBER, 1904. No. 4.

Written for THE CLAY-WORKER.

THE MASTERPIECE OF THE CLAY INDUSTRY EXHIBIT.

The Beauties of Terra Cotta and Faience as Shown by American Manufactures at the World's Fair.

THAT COMPARISONS are odious is often too true, and when one attempts to pick out *the masterpiece* of the Clay Industry Exhibit of the 1904 International Exposition, the pungency of the old saying is keenly felt. One feels like evading the responsibility in the presence of the magnificent pavilion in pressed and enamel brick erected by the Hydraulic Press Brick Company; in the less massive but much more ornate pavilion in glazed terra cotta, exhibited by the Northwestern Terra Cotta Co.; in the masterly exhibit of the Blue Ridge Enamel Brick Co.; in the presence of that bold and beautiful departure in architectural terra cotta undertaken by the Rookwood Pottery in applying its soft, rich, artistic matte glazes to interior terra cotta studies; and last, but by no means least, in the presence of the bold art panel in flat colors exhibited by the Gates Pottery, which is practically an oil painting reproduced on a non-decaying terra cotta body in non-fading, indestructible slip colors. But expositions are mainly attractive to exhibitors for the awards that their skill and ability deserve, and where there is a free and untrammelled opportunity to make comparisons. In selecting the exhibit that commands the most merit for its originality, beauty, technique, and general value, the writer thinks that the Hartford Faience Co., of Hartford, Conn., in its high relief faience panel, entitled the "Sun-Worshippers," is unquestionably entitled to the honor of having produced *the masterpiece* in clay of the St. Louis Exposition.



THE SUN-WORSHIPPERS.
Central Figure or Panel of the World's Fair Display of the Hartford Faience Co.

It is a piece of work that primarily harmonizes and is appropriate for the function it serves—a decorative panel over an open fireplace. The smoky brown flame that licks the sides of the four pilasters which carry the mantel, merge into the dark brown base of the panel on which stand a group of figures in bold relief, in a lighter brown color. They are chanting their daily prayer to the "King of Day," as it rises above the eastern horizon, with its bright, warm rays of gold, and from which radiate, as rising tongues, the flames of heat that are the source of all life. The color scheme is simple yet most appropriate, and ably executed in soft, rich matte glazes. The figures are bold and strong, yet so graceful and with an atmosphere of such feeling that one is almost tempted to also bow in reverence, in sympathy with their devotion. The famous "Angelus" does not inspire the awe and reverence that this group of sun-worshipping Persians produces on the intelligent observer. The panel is enclosed within a simple border of a festoon of myrtle leaves, executed in a dark green that makes an effective setting and a pleasing contrast to the general color scheme.

The figures are draped in loose robes that hang in graceful lines, while there is a transparency in the garments of the two female figures that is very striking and original in a clay study. In fact, the group of ten figures, some of whom are standing but most of whom are kneeling, has the boldness and delicacy of the finest marble carving without its cold, hard lines, and it meets the requirements of the highest development of art in leaving a parting impression of a wish to return to further enjoy its charms.

The composition of the study is equally as strong as the simplicity of the color scheme, and the priest, in his mitred cap, most effectively centralizes the eye on the major motif.

The figures are about one-third life size, and the panel is about five by ten feet in size.

On each side of the fireplace, executed in bas-relief on a dark green matte panel, are the following inscriptions:

> "Once again thou flamest heavenward;
> Once again we see thee rise;"
>
> "Thee the God-like, Thee the changeless,
> In thine ever-changing skies."

The artist of this beautiful and ably-designed conception is Louis Potter, of Boston, but the successful carrying out of his ideas and their permanent preservation in burnt clay is due to the ability and technical skill of the Hartford Faience Company.

The technical skill necessary to successfully reproduce the soft, rich colors of the artist alone places this pottery in the very front ranks of ceramics. But with this high color and technique is a strength combined with delicacy in the modeling room that makes this panel the finest piece of relief modeling ever seen by the writer. As a rule, most attempts in relief work in clay are a failure, from an artistic standpoint, yet no class of work is more constantly attempted and persisted in throughout all lines of art pottery. Relief work presents so many opportunities for strengthening the study and varying the motif that every ambitious pottery devotes more or less time to this dangerous idea; yet how rare are the results of even a passable value. But here is a panel in the boldest, highest relief that surpasses the finest marble statuary in the success of its lines. The Italians have been the most successful in modeling art pottery in high relief, but they have usually debased their work by only applying it to imitative designs, and have rarely worked out original studies in high art in burned clay.

The ground or body of this magnificent panel is terra cotta. It is subdivided into small blocks or slices that have the joints so arranged as to harmoniously work into the artist's scheme. Thus, the rising sun is one semi-circle of clay, and the field beyond is cut up by radiating lines from this center so as to follow the shooting rays of golden sunlight. The joints about the figures have been cleverly placed at the base or fringe of each figure, thus accenting the relief, especially as they have been so colored as to heighten this effect.

With this magnificent, masterful panel is a small group of three Persian heads within a wreath of dark green in the center of a panel of wall tile of a mottled light to dark yellow color. This group is executed in even stronger, bolder relief than the center panel, and follows the same simple but effective color scheme. It is designed by the same artist, Louis Potter, and is a beautiful study in color and modeling in clay. It is even more interesting to the clayworker, as it consists of one piece of clay, about thirty inches in diameter, including the bold wreath in dark green that encloses it.

Whether such fine art work in clay will be appreciated by the American public remains to be seen. No such work is now being made by European potteries, so in this case they cannot show their usual preference in higher ceramic ware for the imported article. But the American public has been so loath to recognize meritorious art work when produced at home as to make it doubtful whether this bold, strong, pioneer effort of the Hartford Faience Company will be a financial success. Fortunately this company makes much less ambitious ware in wall tiling and electrical goods, and the substantial results of these departments may enable the Hartford Faience Company to continue to advance American ceramics and to finally reap the reward that such very meritorious combination of ceramics and the fine arts deserves.

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A Glimpse of a Portion of the Manufactures Building and Lagoon at the World's Fair.

Fountain Spouts Soap Bubbles — Unique Feature in the World's Fair Palace of Liberal Arts.

A FOUNTAIN that spouts soap bubbles is one of the novelties shown in the Palace of Liberal Arts at the World's Fair. It is about twenty-five feet high and is surmounted by a statute of a fairy. Millions of soap bubbles pour out from the top basin, over the sides and into a larger and lower basin, which in turn fills and overflows, the bubbles being carried off at the bottom. The effect is much more brilliant than a water fountain, for each of the tiny bubbles reflects all colors of the rainbow. To add to the brilliancy electric lights are concealed in the lower parts of the two basins, throwing beams of light of all colors up through the bubbles and producing an electric fountain whose effect is magnified by every one of these globes of water. The bubbles are produced by specially built machines which agitate the soap in clear water and under pressure force it up to the top of the fountain.

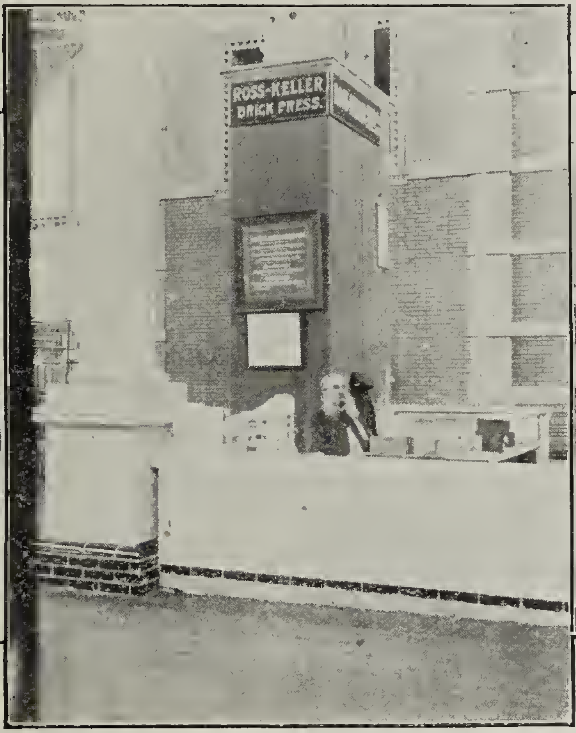
Written for The Clay-Worker.

ODDS AND ENDS AT THE WORLD'S FAIR

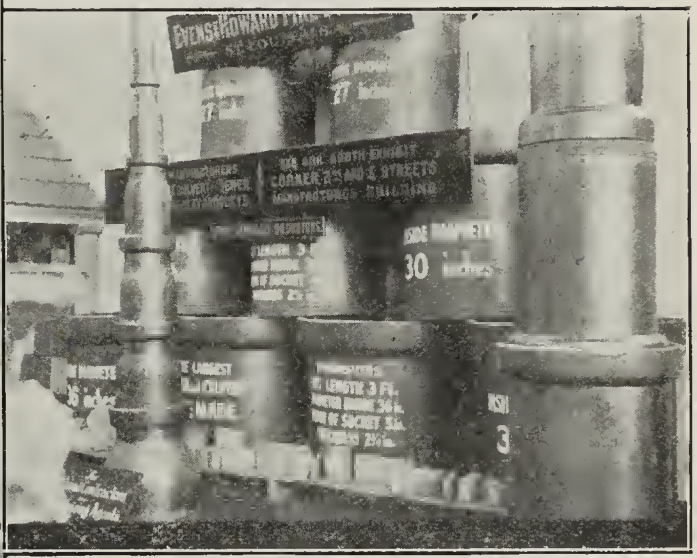
[SECOND INSTALLMENT.]

In THE ANTHROPOLOGICAL section of the World's Fair can be found some very interesting things for the clayworker. The Egyptians of "ye ancient times" certainly were good clayworkers, judging from the genuine old specimens shown. The claim is made that some of the pottery shown dates from 4500 B. C. Glazed work is also shown which was made in the XVII to XXVI dynasty. There are also shown molds in which the "all-seeing eye" was cast. These molds are rather crude in their way, yet they could be used by the modern clayworker with good results.

A Fine Display of Fire Brick and Other Refractory Ware.



Aaron Woodhull, the Man Behind the Model of the Ross-Keller Press.



An Assortment of Sewer Pipe, etc., Shown by Evens & Howard.

While the writer was examining this exhibit, he overheard the following conversation:

She—John, come over here and see this Egyptian water filter.

He—Mary, look and read the sign.

Sign—This is a beer jar.

Question—Were the Egyptians temperance people?

Apparently not, as they were acquainted with the brewers' art.

Specimens of a peculiar glassware are also shown. It appears that these Egyptians would make a form out of clay, then wind various colored glass around it, then dissolve the clay core out and fuse the shaped glassware together. The question is, is this form of producing glassware one of the lost arts?

On the Sarcophagi these ancients used a clay filler in order to have a smooth surface upon which to make or plan their paintings and writings.

Quite a good deal of favorable comment was created by the exhibit of the pupils of Prof. Charles Binns, of New York, and the opinion was expressed quite freely that there was more than one among these pupils who would in good time prove himself the right man "behind the gun."

In the Illinois State exhibit in the Mines Building can be found some very fine specimens of amorphous silica which is practically disintegrated flint. It runs about 99 per cent. silica and is almost as fine as though it had been water floated. The supply is practically inexhaustible, and judicious experimenting by the intelligent clayworkers will develop its utility.

Apparently it has no grit, as powdered flint would have, hence a very large percentage of amorphous silica can be used in a clay mixture without destroying the primary clay plasticity to a very great extent.

The State of New Jersey has two exhibits that should prove of vital interest to clayworkers. One relates to brick clays and the other to pottery clays. A full statement of the properties of each kind of clay is given, embracing elementary and physical analysis, tensile strength and the three essential burning points, viz., incipient, complete and viscous vitrification. Briquettes are also shown illustrating the shrinkage in drying and burning. The latter show the different colors produced under the various heats. The State of New Jersey will shortly issue a geological survey and report on clays, and as the work is carried on under the supervision of Dr. Heinrich Ries, is certainly good guarantee for the accuracy of the statements to be found in the report.

The Laclede Fire Brick Manufacturing Company has a very interesting exhibit in their five-bench multiple gas retort system in the Manufactures Building, and the fact that they have been in business for fifty years has proven no bar to their adoption of modern manufacturing methods.

In the Hungarian Exhibit can be found some beautiful specimens of open-work or filigree majolica. The attendant in charge claims that this particular line of art clay ware is typical Hungarian ware, as that certain style has been made in Hungary for over fifty years, and is to-day a great favorite with the people.

In Portugal's exhibit can be seen a series of eight large plaques which have a peculiar finish in the glaze, which creates the impression to the onlooker that the artist had just left his work and the paint was still wet. From an artistic standpoint these plaques are charmingly beautiful. They represent (1) Terra, (2) Aqua, (3) Flora, (4) Fauna, (5) Fish, (6) Game, (7) Fruits and (8) Flowers.

In the Austrian exhibit can be found some elegant samples of potters' ware; one exhibit being of special merit, consisting principally of terra-cotta statues and statuettes, adapted for use in supporting electric lights. The gem of the collection is a life-like figure, entitled, "The Dancer," which was made for our "Teddy."

Errico Bros., of Naples, Italy, exhibit some beautiful specimens of the ceramist's art—one beautiful large frame for a looking-glass and two large, exquisite vases or urns. The coloring is in perfect harmony, and the designs are worked out on charming outlines commensurate to the subject. It certainly shows the expert workman, when such large pieces are turned out without flaw or blemish.

In the Vatican exhibit can be seen some lovely mosaics. The coloring is superb, outlines and details without a fault. In fact, the first impression one has when looking at them is that he is gazing at an oil painting. These mosaics are made of fluxed silica combined with clays and coloring pigments. The claim is made that they have an assortment of 22,000 colors, shades and tints to select from; therefore, it can be readily seen what means they have at command to effect the charming blending and shading that these mosaics show. Here seems to be a good opportunity for the enameler and glazer to study up tints and colors.

Mr. S. Mitchell and the Unique World's Fair Display of the Mitchell Clay Mfg. Co.

Exhibit of the Mound City Roofing Tile Company and a Group of Distinguished Visitors.

Office and Display of the Schwarz Sand-Lime Brick Company.

Written for THE CLAY-WORKER.

ST. LOUIS BRICK AND BULDING NEWS.

A FAIR AMOUNT of business has been done by the brick and terra-cotta manufacturers the past month. The outlook indicates that from now on conditions will remain as they are now until the first of the year. The manufacture of brick will continue as long as the weather will permit. Prices have not changed any for some time, and the prospects are that they will continue as they are. The prices now quoted are: Merchantable brick, $7.25; strictly hard and red, $8; ordinary hard and red, $7.50; front red and stock, $18; sidewalk and paving, $10.

Building operations promise to be fairly active for some time. St. Louis needs more building of all kinds, particularly dwellings. It is a statistical fact that more citizens in St. Louis own their own homes than in most any municipality in the United States, with one exception.

The tendency to own homes is growing more so each year. It is more manifest now since it is almost as cheap to buy a home than it is to pay the high rent that has been in force the last few months. The laying out of new suburban additions and the opportunities to secure good locations at moderate prices are being multiplied.

One of the causes which operated to prevent over-construction in the city on the eve of the World's Fair was the immense demand for labor and building materials required at the Exposition itself. A premium was placed on material and labor too high to suit the average man wishing to erect a residence or add to a business house. He has reasoned that it will be a saving to wait until wages, etc., resume a normal level. Therefore, the home-builder and the speculator have been out of the market, and with these two elements missing, a peculiar situation has developed to reflect strongly and creditably the conservatism of St. Louis.

The following are the official figures showing the building permits for the last several years:

1903	$14,500,000
1902	12,854,035
1901	13,207,991

The building permits for 1904 up to September 1 aggregated $9,045,992.

It will be seen that the decrease has not been abnormal, and most of the building done in 1903 was of a character to permanently benefit the city, regardless of the World's Fair. For example, there was real need of more hotels for ordinary times, and among the new ones erected at a cost of several million dollars were the Jefferson, Washington, Hamilton, Buckingham, etc.

Rents have naturally had an upward tendency, owing to the Exposition, but this increase has not been so great as in other cities under similar circumstances. This condition again shows how conservative St. Louis is and the beneficial results of this conservatism is being felt to the full extent since the Fair.

The benefits to real estate as the result of the World's Fair have not as yet been fully realized, but they soon will be, for the reason that the city's proverbial conservatism prevented a boom on the eve and during the great World's Fair.

The city's realty interests have been promoted also by the large sums which the city has spent upon permanent street improvements in preparation for the Fair. St. Louis has expended about $8,000,000 along those lines, and the result has been a general enhancement of real estate values.

This activity of city improvements has likewise aroused interest in a general plan for such work to extend over the coming years, and it is believed will inaugurate a more liberal and far-reaching policy, which will be carried out after the World's Fair has become an incident of history.

The shale brick of the Banner Clay Works, of Edwardsville, Ill., owned by St. Louis gentlemen, was tested by St. Louis experts during the past few days and pronounced of exceptional quality.

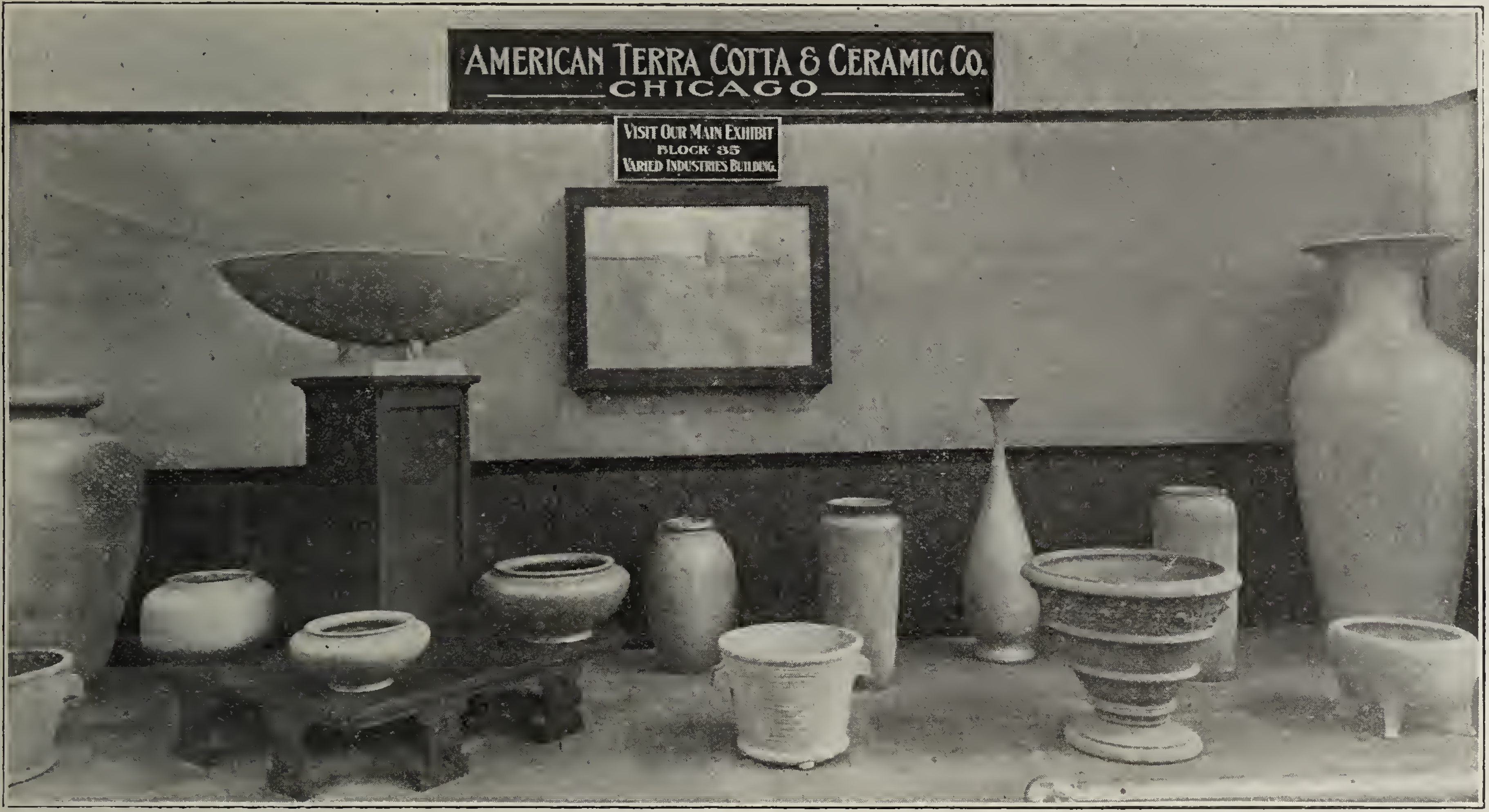
Thomas P. Keyes, a real-estate man, was rearrested by a deputy sheriff a few days ago, after being released from the Court of Criminal Correction, because an indictment against him for obtaining money under false pretenses, was defective. Mr. Keyes was the promoter of the St. Louis Cement Brick Manufacturing Company.

Permits for twenty-four brick buildings and twenty-five frame structures were issued September 26, at the office of the building commissioner. This is the record for the office and indicates an unusual activity in the building line. The largest building for which a permit was issued on that day was the teachers' college, to be erected by the Board of Education. It will be a three-story brick structure, 82 by 202 feet, and cost $118,500.

William F. Scott, president, and Peter B. Gibson, secretary of the Scott Manufacturing Company, having a factory located at Keokuk, Iowa, have taken charge of the general sales department of the company and have located in the Commonwealth Bank building, Broadway and Olive streets, St. Louis, where they have a handsome suite of offices. The latchstring is always hanging out to brickmakers and to their friends. J. N. D. Dickinson, treasurer of the company, is in charge of the factory and offices of the company at Keokuk, where a full line of dry-press brick machinery is made, including "The Press that Scott Builds," the Scott clay pulverizer, the Scott clay mixer and the Scott dry press, as well as everything in the dry-press brick line.

The Scott Manufacturing Company, a few days ago, contracted with the Success Brick Machine Company of Memphis, Tenn., to handle that company's full line of soft and stiff mud machines, and in return the Success Brick Machine Company will represent "The Press that Scott Builds" and the rest of its auxiliary machinery, all of which go to make up the "Scott Noiseless Plant."

A. SAINT.


AMERICAN TERRA COTTA & CERAMIC CO.
CHICAGO
VISIT OUR MAIN EXHIBIT
BLOCK 35
VARIED INDUSTRIES BUILDING

Collection of Teco Ware Exhibited at the World's Fair by the American Terra Cotta and Ceramic Company, Chicago.

CALCAREOUS BRICKS IN GERMANY.

(From United States Consul Muench, Plauen, Germany.)

There are as yet no factories for the production of sand-lime bricks within the limits of this district, Plauen, Germany, though many have been erected in other sections of Germany within the past few years. There does not seem to have been uniform success in the production of sand-lime bricks in Germany. In a recent number of the *Thonindustrie-Zeitung* reasons for this non-success are freely discussed, and may be summarized as follows:

So many plants have been suddenly erected that bad results have grown out of the lack of proper experience in handling, rather than out of defective equipment. The main causes for defective products are inexperience in slacking lime and in mixing the mortar. Good white lime and clean, sharp sand are necessary for good results. The product is rarely spoiled in the mere pressing and drying. Naturally that brick will be best which is pressed the hardest, but the customary presses are entirely adequate; hence the two reasons above assigned alone remain. In handling sand-lime bricks one frequently finds in them clods of clay the size of a filbert that naturally destroy their value, which depends upon so perfect a mixture that no lumps remain and every grain of sand has its coating of lime. Imperfectly slacked lime is even more detrimental. The process of slacking greatly increases the volume of the article, and if insufficient water be added in the process, absorption of moisture from the atmosphere takes place after the brick is made, expanding it and causing seams or cracks in it. Such cracks may be too small for ordinary detection, yet the defect is nevertheless a serious one. It is caused by slacking sufficient water to produce a soft, mushy powder, damp enough to admit of balling, but the plan of allowing the mixture to rest in the bed for at least twenty-four hours, instead of at once feeding it to the press, is the safest. Little differences in composition are thus equalized and the mixture becomes more pliable and plastic.

HUGO MUENCH, *Consul.*

Plauen, Germany, June 11, 1904.

The machine which does not answer your purpose may be just what some one else needs. Tell the "needee" about it in a card in the "For Sale" columns of THE CLAY-WORKER.

Written for The Clay-Worker.

A GREAT DRY PRESS BRICK MANUFACTORY.

A Glimpse of the Ittner Plants, Making 124,000 Red Pressed Brick Per Day.

WHEN THE WRITER, in company with Mr. Ellsworth Ogden, of the Ohio State University, visited the Ittner brick plant, which lies a few miles east of St. Louis, one sunny day in July, the welcome extended to us by Warren Ittner, who is in charge of the plant, was like the weather, warm. Here near the town of Bellville, more than a decade ago, Anthony Ittner erected two fine pressed and building brick plants. These are now owned and operated by him and his sons, under the firm name of The Anthony Ittner Brick Company. As most of the readers of The Clay-Worker are doubtless aware, he had previously operated extensive yards in St. Louis, but having exhausted his clay deposits there, he re-established himself near Bellville, where there are immense deposits of fine clay.

The plants are located on a tract of seventy-five acres of fine glacial and alluvial clay averaging thirty feet or more in depth. Below the bed of clay is a five-foot vein of gravel resting upon a rich coal deposit. There is a working coal mine a short distance from the plant, from which they obtain coal suitable for burning their brick at the very reasonable price of 80 cents a ton. With this inexhaustible supply of raw material and the fuel with which to burn it to be had for the digging, Mr. Ittner and his sons expect to continue in the brick business in the years to come, provided, of course, the labor unions do not assume absolute control of all mundane affairs. In the latter event, they may change their plans, but otherwise expect to continue "doing business at the same old stand" until the third or fourth generation at least.

Approaching View of the Ittner Brick Plants.

The clay field is fairly level, sloping slightly to the southeast, so that the clay is easily taken up by means of the Quincy gatherers and stored away in the large clay sheds, which hold enough clay to make over forty millions of brick, the average yearly output of the two plants.

Each Quincy gatherer makes one hundred trips to the fields a day, collecting enough clay to make thirty thousand bricks, averaging three hundred to the load. The clay is taken from the sheds in cars and deposited in roll crusher, from which it is taken in cup elevators to the top of the building and then into the pulverizer.

Steam heat is applied to the roll crusher in a very unique manner by means of small pipes in such a way as to heat the clay, thus preventing the clay from sticking and clogging the machinery. This is a very economical way of crushing the clay and saves the wear and tear on the machinery.

Of the two plants, the larger has a capacity of eighty-eight thousand bricks a day, while the smaller makes thirty-six thousand, a total of one hundred and twenty-four thousand bricks. Only red brick are made at the plants, but they are high-grade brick, a large per cent. of the output being ornamental and face brick.

At the present time there is always one kiln being fired at each plant. At the larger one there are nine furnace kilns with forced-down draft. These kilns are sixteen by fifty-six feet, and hold one hundred and eighty thousand brick. The green brick are piled high in tiers fourteen feet high, facing three at a time in rows of forty each. This plant has three Andrews presses. At the smaller plant there are five twenty-five by fifty-six-foot kilns, each one having a capacity of three hundred and seven thousand. These kilns are seventeen-foot arch up-draught. At this plant they have five presses, three Andrews and two four-mold hammer presses.

Near each plant two large ponds have been made, having a depth in some portions of nearly forty feet. Around the edge of these ponds are seen cat-tails and water-lilies, but this doesn't prevent bathing parties from taking a plunge into the cool water. Mr. Ittner some years ago stocked the larger pond with fish and his sons now relate that many a time they have had two or three-foot bass on their lines, but have been unable to pull them out, owing to the slippery condition of the clay soil around the pond. This would evidently make a great fishing hole for some of the old-time clayworker fishermen who have spun their yarns at the conventions, and we advise them when they make a trip south to Bellville to take along their lines and poles.

Mr. Ittner started in the brick business when he was but a lad of twelve, loading brick, and has risen to a position which any brickmaker would be proud to hold.

The Machine House Yard No. 1.

His success as a brickmaker is due to untiring energy and unswerving integrity and good "horse sense." No man engaged in the brick business has greater faith in the stability of the industry. His enthusiasm in all matters pertaining to the making and using of brick is convincing, and it is little wonder that his sons have identified themselves with him in the work. It is a safe prophecy that the name Ittner will be intimately connected with the brick and building interests of St. Louis for many years to come.

J. E. R.

THE EXTRAVAGANCE OF PENNY WISDOM.

A "penny wise" policy in advertising—what a farce it makes of the business! As well train for an athletic contest on bread and dried apples. A growing thing needs full nourishment; rob it of this, and you lose, in the dwindling that is inevitable, not only the growth you have been led to expect, but all the benefits of the past invstments.—*Exchange.*

Written for The Clay-Worker.

THE OUTLOOK.—No. 6.

THE EMPLOYER AND THE EMPLOYE.

THE POINT OF VIEW from which one studies a subject has much to do with his opinions and conclusions concerning that matter. Too often we fail to realize that there is another side to the question in controversy, and refuse to give credit to testimony derived from the other man's view-point. And thus comes the endless controversies between the laborer and his employer. It seems out of the question for them to see matters in the same light. That their interests are identical may be good philosophy, but it does not work out that way in this day of hustle, bustle and sharp competition. Close margins of profit make such a close calculator of the manufacturer that he may forget the rights and interests of his workmen, while there are many causes to lead the laborer to believe that he is not getting value received for his services. These causes are not new, but are as old as history. There must be men who superintend, and men who labor with their hands. There has always arisen trouble between these two classes, and there is no doubt that both sides are seriously to blame for unsettled conditions. We would not claim this to be a one-sided question, but our view-point will be from that of the employer, and our aim will be to study the indications for a settled condition of the labor question and the benefits that flow to the manufacturer because of a steady labor market.

Machine House Yard No. 2.

We have often viewed with considerable apprehension the effects of the demands made by organized labor of their employers. They were so persistent in their determination to completely overturn conditions that have obtained from time immemorial, and were so well organized that they seemed able to command the situation. It was such a new idea that the workmen in a factory should practically name their own wages, fix their hours of labor, decide who should work and who should not, appoint their own foremen, in fact, have more control of the plant than did the company who financed and constructed it.

Whether this was a step in the right direction, or whether it was mere tyranny born from a knowledge of power, I shall not attempt to discuss. But one thing was very plain to all employers of labor—a few more steps in that same direction would leave the employer nothing to do but to pay the bills, a very doubtful honor when one takes into consideration the fact that he would have practically no control of either the debit or credit side of the ledger. Competition would control his income, and his laborers control the outgo, thus placing him between the two stones which would surely soon finish his grist. Something had to be done. The situation would no longer bear delay of action. It is remarkable how rapidly sentiment in favor of united action by employers crystalized, and how soon the strikers met with determined efforts in opposition to their demands. Employers all over the nation, without waiting to form an employers union, took a decided stand for their own rights as they understood them, and organized labor faced a situation so different from that to which they had been accustomed, that strikes could but end in failure. It is true that in some cities there were formed employer's associations for the purpose of concerted action and for mutual protection from violence, but the strongest point in the whole situation was the oneness of public opinion that the demands of union labor had ceased to be a cry for justice, and had become a menace to liberty and free institutions. The fight was not against the demands of union labor alone, but also against their means to obtain their ends. The battle has been a hard fought one, and neither side has yet acknowledged defeat. But there is no doubt that union labor has lost ground during the last two years, and more especially during the year 1904. They have suffered defeat time and again, and have nothing for consolation but re-organization and the hope of being able to strike again at some future date.

This failure of union labor to secure their demands, and the consequent loss of influence, has done much to settle conditions all over the nation, even in these sections where union labor was unknown. Employers of labor should congratulate themselves over the results of their fight, for it means an abundant supply in the labor market, and what is of more importance still, we will be able to manage our own affairs without consulting the labor bosses. We will not be required to dismiss tried laborers, simply because they refused to join the union, neither will we be forced to look for the union labels upon goods before we make our purchases. This means an opportunity for the brickmaker to do his best in the manufacturing end of his business. In a few sections there may still be strikes and lockouts, but there is no scarcity of laborers this year. There are plenty to do the World's work and still leave a few over to join the ranks of the disgruntled crowd.

The Kilns on Yard No. 2.

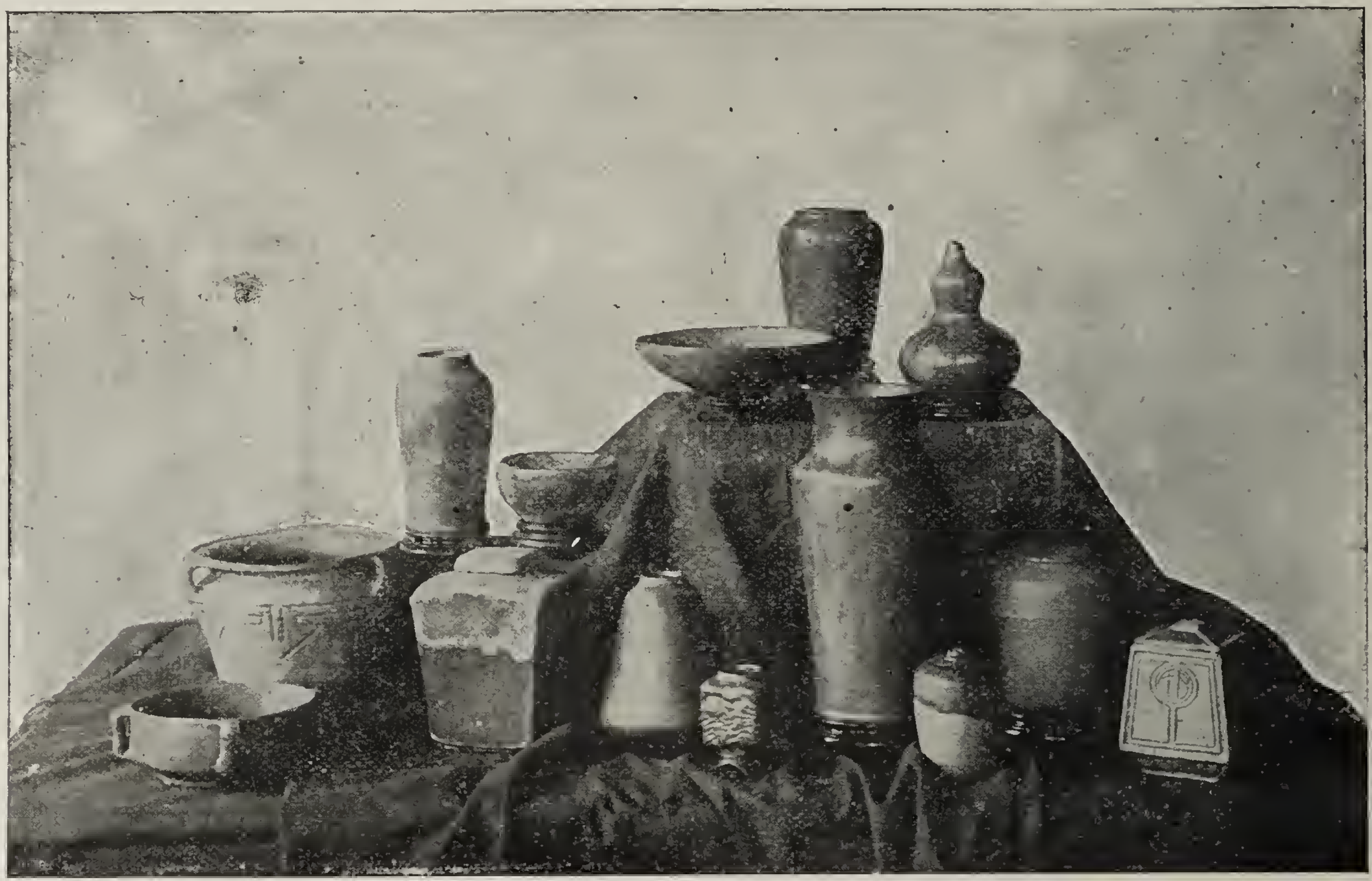
I said in the beginning that I should write this article from the employer's standpoint. I confess that I have not said a word about the rights of that great army of laborers to whom we are indebted for the muscle and brawn that makes possible the enterprises of which we are so proud. I am not willing for this article to go to print without adding a few words that will not be a retraction of any sentiment expressed formerly, but still will put a less selfish aspect upon the article as a whole. It never pays to be selfish, for selfishness ultimately defeats its own aims. Our workmen have rights that we must respect, but I have not yet reached that stage of evolution where I can be willing for them to have a voice in the general management of our business affairs. The old notion of the relation of employer and employe still sticks in my cranium. I believe in giving a good man a chance, and all men fair treatment. But when men interfere in any way with the management of our affairs, I claim the privilege of sending them to seek employment elsewhere. And then I want no dictation as to who shall fill their places. If that is tyranny, I shall not object to any name one may see fit to call it.

Good wages and fair treatment are the practical exponents of the Golden Rule between a man and his workmen.

L. C. MOORE.

CLAY IN THE POTTER'S HANDS.

SO ATTRACTIVE has clay proven as a means of artistic and individual expression in all ages and among all peoples, and so much has been written on the subject, that it would seem that nothing further could be added to the interest of the art itself, or to the literature attending it. It happens, however, in this twentieth century, and happens fortunately, that a return is being made to first principles and to the simplicity of the dawn of industrial art. A second Renaissance is making itself felt; and, while *l'art nouveau* represents its extreme and even erratic development, there is, at the same time, a solid and enduring foundation upon which the movement rests. The growth of civilization has not been an unmixed blessing, for as man's needs have multiplied they have been met by a mass of meretricious adornment both of person and property. Much of this extraneous matter has been put forth and accepted in ignorance of what is right and true, meeting with approval from those who valued expensive elaboration of whatever kind. But we are changing, if we have not changed all that. The new century is leading back to elemental laws and things are finding their true position.



Alfred Pottery with Flowing Matte Glazes.

Clay, like other media, is sharing in the renaissance. It took part, even if unwillingly, in the debasement, and must not be neglected in the new birth. The very ease with which clay can be worked has often led to its abuse. The facile plasticity which it possesses beyond and above any other substance led to its use as a medium from which form was to be transferred to something more enduring. The sculptor used clay in which to realize his ideas, but there was no thought of preserving the clay model. It would, when completed, be molded and reproduced in bronze or marble, and the clay which received the master touch was destined only to be broken down and cast away. Even when the clay itself was preserved, it was not in the original. A plaster mold was taken from the model and in this a replica was shaped. The reason for this procedure was two-fold; it was considered unwise to risk the original work in the fire, and the clay used for the model was not adapted for burning.

The first step towards the restoration of clay to its rightful place was taken by the makers of architectural terra-cotta. Pieces of decorative work which were not to be repeated were modeled direct in the terra-cotta clay. Such a clay would be composed with a view to its being burned. It would not be as plastic as modeling clay, but would, nevertheless, move freely in the fingers, and was well adapted to broad and massive effects. Such work, however, while sound in principle, was not undertaken from the right motive. It was prompted purely by commercial considerations. It was cheaper to have the artist model in the terra-cotta clay than to make molds and use them when only a single piece was required. Moreover, the subject of such modeling was rarely good. The larger part of the modern production of terra-cotta is far too ornate. It is also false in color. There seems to be a general agreement among architects that terra-cotta, both in color and treatment,, should resemble stone. The gray of building stones is more frequent than any other color, while the lines of the stone cutting machines are constantly imitated upon the clay surface. This is a double lie when used upon a steel structure. A building constructed of stone could not possibly attain the height now commonly reached in steel, and if the building be of steel a facing of stone is no protection to the frame. Clay must and will assert itself in the near future, not only as regards color, being recognized as clay by the man in the street, but also in its function as the only real fireproof material.

This is a digression made only to point out the individuality of clay when used, as every material should be used, in view of its natural qualities.

It is, however, in the studio and in producing objects of household service that clay is found at its best. This point has been reached through a long period of evolution. The struggle has been hard, but at length it seems that truth and simplicity are to prevail; that the artist is again to come into contact with his client and to impress his life upon many homes, without the intervention of machine and mold.

The art nature is essentially imaginative. It perceives more than can be seen by the layman, and should be united with a dexterity which shall convey the vision to others. The artist is the eye, as the preacher is the voice, of the people, but before the eye can tell the brain what it sees, the nerves and arteries must be trained and active. The skill of the hand must exhibit the imaginations of the thought, or the people will remain untaught.

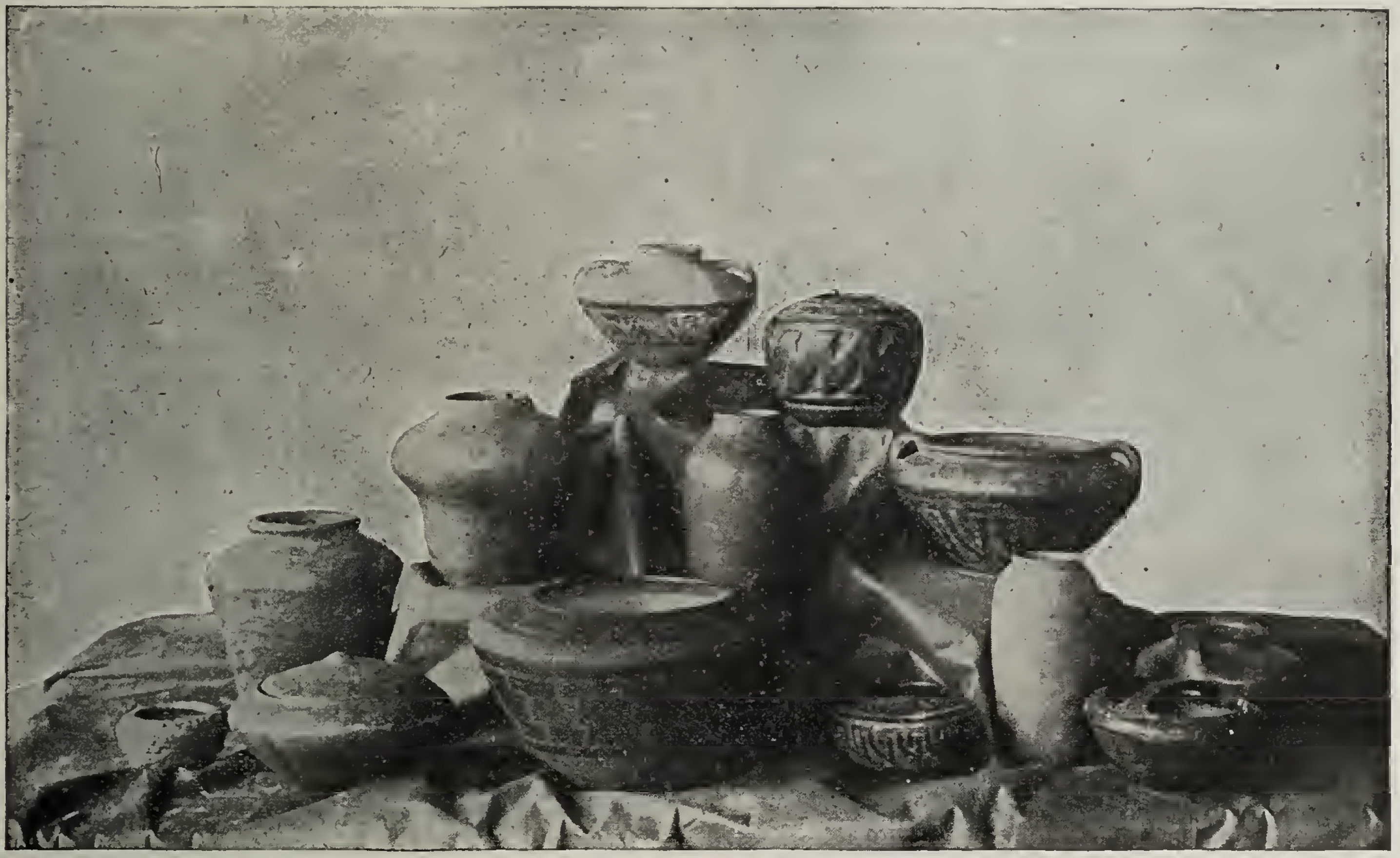
Nothing can be more attractive than working in clay. The fascination of the plastic earth long ago took possession of the primal mind. The untutored savage, wherever and whenever found, took delight in fashioning vessels of clay. At one time they were simply for containing food, at another they received the ashes of the honored dead; and if art be the "expression of man's joy in his work," then truly these primitive pots are artistic. Joy finds a language in many ways, whether it be in the inimitable masks of Yucatan or the figurines of Tanagra; the priceless porcelains of the Mings or the flowing glazes of Thomas Inglis.

Anything produced by one's own exertions acquires thereby a special value,—"a poor thing, but mine own,"—and even the savage who produced an enduring work in clay must have felt something of the pride of parentage.

The possibilities of clay are becoming more fully recognized year by year. As handicraft weaves its spell around the community, certain lines of natural expression appear to be in evidence. One of the most prominent of these is in the use of clay. The children found this out long ago, and are always happy when making mud pies. But such work as this is imitative and not expressive. What is desired is the realization of an idea, the visible presentment of an informing thought.

The power of expression is not to be secured without labor. Ruskin has said that it cannot be expected that such a gift can be bestowed upon one who will give no price for it, and though he spoke specifically of pictorial expression, the statement is of general application. Clays are willful. Perhaps that is why they are so human. The art of manipulation is the outcome of long and arduous practice, and many failures must be faced before the ideal can be realized. In this, perhaps, clay is peculiar. Basketwork and textiles can be touched and retouched, colored and manipulated, with the knowledge that the worst, or best, is known. Metal work and jewelry are finished when the tools and baths have done their work, but of pottery it may be said that when the clay leaves the hands of the potter his work is but begun. Whatever the beauty of the form, how intricate soever be the plastic expression of the incised design, the ordeal of the fire is inevitable. This fact constitutes at once the potter's trial and his triumph, and gives to clay work its fascination and its fallibility. A piece of pottery is never made until it ahs been burned. The fire not only translates it from earth to the pride of permanence, but it produces the final color which has hitherto lain dormant and often unsuspected.

It was but a short while since it was believed that clay work could not be produced without special appliances. The wheel was difficult, if not impossible, and molding was undesirable because of its lack of individuality. Then a study of Indian methods opened the way for clay building. Taking a very plastic clay, the Indian women would roll it into thin cords, and, coiling these in spiral fashion, would weld them together by finger and thumb. The work thus produced was not so perfect in finish as that formed upon the wheel, but, on the other hand, it exhibited a special quality which the wheel did not afford. In pottery which is fashioned by the hand method, there is a sertain vibrant undulation of surface which at once removes it from comparison with tool work or machine finish. Not that the potter's wheel is to be classed as a machine; but in shaping a piece by the wheel there is an almost irresistible desire to turn and polish the clay until it assumes a mechanical quality. This is so impossible in hand-shaped work that it ceases to be desirable and the plastic character of the substance remains in evidence.



Alfred Built Pottery in Indian Style.

The introduction of this method into American studios has proved highly attractive to those who have been seeking a new method of expression. The mere painting of pottery produced by factory hands lost its charm as compared with the creation of original work, and numbers of active workers are now engaged in fashioning their own wares and fathoming the mysteries of fire and glaze.

Contemporary with this new departure, and ministering to its needs, arose the means of securing information upon the essential technical points of ceramic composition.

The fact already alluded to, that all clay work must pass through the fire, renders a knowledge of the composition of clays of the first importance. Scarcely two clays behave alike in the fire. One may remain porous; another, similar in appearance, may fuse. One may burn to a buff color, another to a white, and yet another to a red. These differences are caused by variations in composition, and some understanding of these is of great value. When to these facts is added that the necessary glaze is a complex chemical combination, it will be seen that technical knowledge must be inseparable from success in the true field of ceramic creation.

It is not long since it was generally considered that the knowledge alluded to above was a closely guarded trade secret. Thick veils of mystery have been woven around the compositions and processes of the clayworker. Not very long ago the newspapers published an account of the establishment of a clayworking plant in the West. The owner of a deep secret deposited the formula in a fire-proof and burglar-proof safe and offered to surrender the key when the necessary capital had been raised. This sharp practice was probably resorted to in order to attract purchasers of the stock, but is, at least, evidence of the belief in an inscrutable mystery as being inseparable from the production of pottery.

The veil is being pushed aside. Those who desire to learn, can now ascertain the methods and mixtures which are used by ceramists. By entering a good school they can, moreover, pursue original studies under competent guidance and can equip themselves for the work of individual expression in clay.

Point Europa, Gibraltar.

The field of clayworking is so wide that there is no necessity for treading a beaten path. For many centuries the potter has been at work. In all parts of the world the results of his labor are seen. Variations in clay, in form, in method, in fire, in glaze, in color and in treatment have been practiced, but the end is not yet. Many of the ancient works could be repeated under modern conditions with advantage, and many of them suggest changes which recent advances have made possible. The artistic training which has become so general has revealed new beauties in half forgotten works and has inspired the observer with a desire to do likewise.

The fascination of this work lies partly in the fact that whatever inspiration may be drawn from the work of others, there need be no copying. It is more difficult, in fact, to copy another work in clay than to produce something original, and in this, as in all expressive production, the appetite grows with its food.

In almost every direction the making of pottery satisfies the aspirations of the craftsman. In form the most subtle and seductive lines are within his reach. The delicate shading of undulating surface, the sympathetic texture of suggested plasticity all appeal to the art nature, while in color nothing is denied. And all this—form, surface, texture and color—is derived from common materials, developed by simple means and rendered permanent by the penetration and the purifying of fire.

Written for The Clay-Worker.

A BRICKMAKER ABROAD.

Gibraltar and Algiers.

WE SAILED A DAY and a half northeast from Madeira, and early in the morning saw the most famous Rock in the world towering before us. Several whales appeared near the ship and others were spouting in the distance, which gratified a curiosity which had remained since childhood. The privilege of seeing Gibraltar was another gratification which was more than I had dared to hope for in the days of my youth when studying geography and history. The advertisements of the "Prudential" has been a reminder, and kept the "impregnable Rock" before the American people in the same way Mt. Ætna was used by a fire insurance company.

Although so many descriptions had been read, yet, in my mind, the rock had been pictured as facing the Mediterranean, looking south toward Africa, but not so, it faces toward Spain. A number of warships lay inside the stone wall, and the harbor was full of vessels of all sizes and description. The German Emperor was a visitor at this time, and his ship lay up near the city. We were anchored far outside the wall, and the passengers were taken ashore on steam tenders. When landed, the all-important point of interest was the fort, and a guide piloted us up, up the hill through narrow, winding streets, until we came to the entrance where the soldiers were stationed, and we were required to write our names. It was a perfect mob in a few minutes, hundreds arriving at the same time and all anxious to be moving. Soldiers were stationed every 40 or 50 feet, and a certain number were allowed to pass at a time, so after a number of halts of 15 or 20 minutes each, fully two hours had passed before we reached the Castle of Communication. Walking through a dark tunnel, water dripping from the roof and mud in the pathway, we were hurried through, wondering what was next, and almost wishing we had not undertaken this part of the program when a short walk in the sunlight at intervals relieved the unpleasantness, and finally we were ushered outside the wall for a view of the city, the harbor and the towns in the distance. It was indeed a beautiful picture, and gave us a good idea of the fortification and its means of defense, but we well earned all we saw. It was only a little sample of the whole thing.

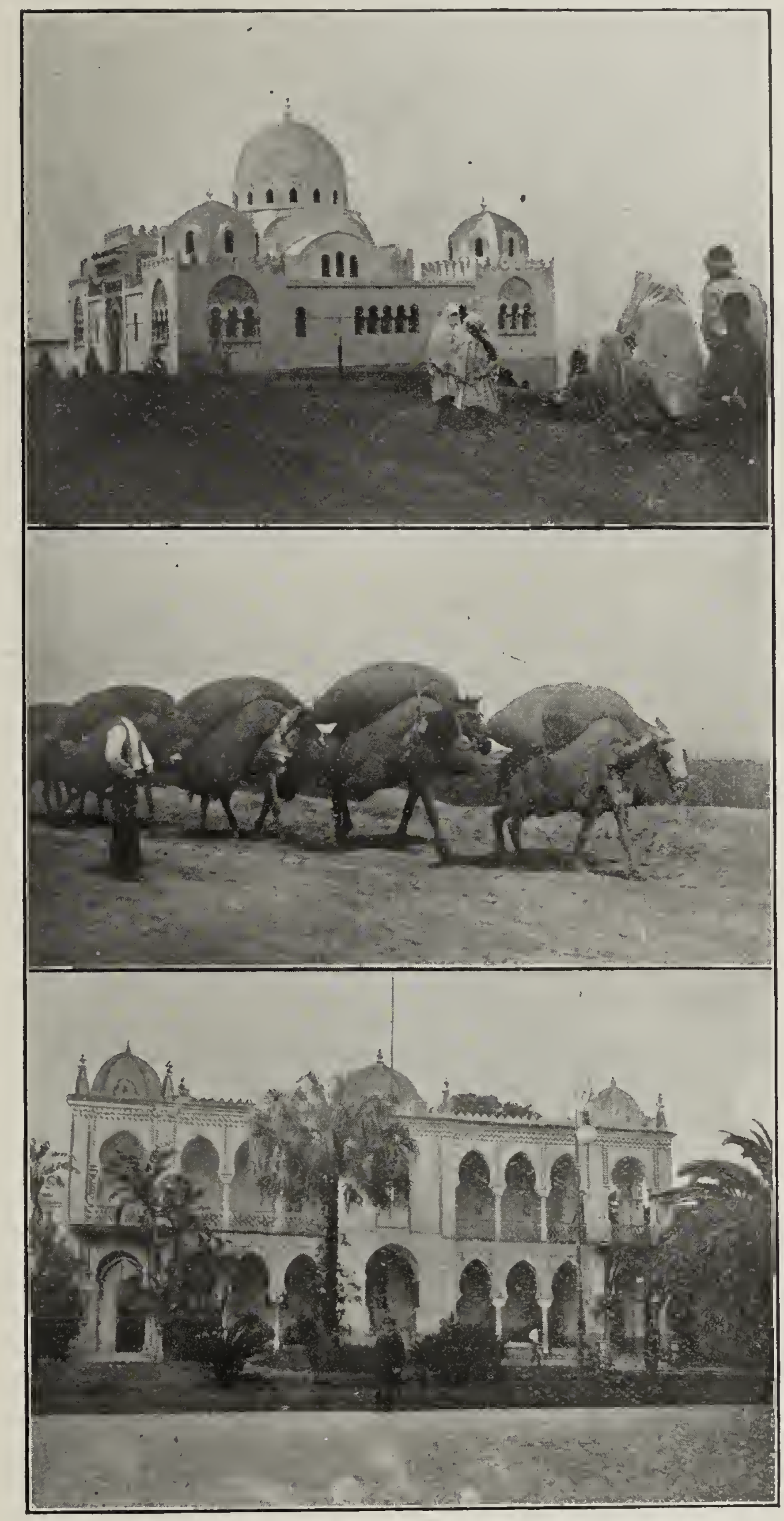
The Rock—Gibraltar.

When we were back on the ship and marked the spot where we had stood, it was not near half way up. The Rock rises over 1,400 feet and is three miles in length. It is honeycombed with tunnels and every spot from where a gun can be brought to bear is occupied by a cannon which oftentimes quaintly peep out of the most secluded nooks among geraniums and flowering plants, while huge piles of shot and shell, some of enormous size, are stowed away in convenient places, screened from the enemy's fire, but all ready for use. The magazines of stores and provisions show that "in time of peace they are prepared for war," and all were filled with admiration for old England. She maintains her hold at the cost of a million dollars a year and we hope she may always keep it. Five thousand soldiers are stationed here, and they are a fine looking body of men. A carriage was taken from the foot and in going down the hill the driver tied the hind wheel to the brake with a rope and walked down the steep places. Many of the streets are narrow and are stone steps, as you see in pictures. These, of course, are used only for pedestrians. The population is decidedly mixed, English, Spaniards, Jews and Moors, the latter with their bare legs and fantastic dress, but everybody was in gala attire and everybody was on the street on account of the German Emperor, and flags and decorations were everywhere. The women are brunettes, and wear their hair very much pompadoure, while the powder and paint is used on even the smaller girls. We drove to the Alameda gardens and on to the naval dock yards in the Eastern part of the City. On our return we crossed the strip called Neutral Ground and visited the little Spanish town on the border, just to have it said we had been in Spain, but there were no attractions and the soldiers that were garrisoned there looked so inferior that I thought the United States did not deserve so much credit after all for their victories, if these were specimens of Spanish soldiers. We sailed away in the glow of the evening, passing through the Straits into the Mediterranean. It is 15 miles between Point Europa and Cape Centa—the narrowest part being nine miles. As long as we could see, we watched these points of natural and historic interest, and as they faded from our view against the beautiful coloring of the western sky, we knew we had seen it under the most favorable circumstances and it had been all and more than had been anticipated.

We were fortunate in having a day of rest before we reached Algiers. It was 2 A. M. when they dropped anchor, so we had a full day to see the city. It seemed natural to hear the whistle of a train and see the trolley cars. The cities thus far have walls--walls everywhere. The masonry in these old towns amaze us, and it looks like they might last for centuries. Our ship was inside the wall of the harbor at this point and the passengers were taken ashore in small boats. The buildings facing the water's front are six or seven stories high, with balconies the length of the building, or in front of each window. By nine o'clock our company was in carriages and the long procession started for a ten-mile drive. Here we were in Africa and in Algiers, the home of the pirates. We can well conceive why this would be the nest of these outlaws for as we climbed up and up the hillsides we saw the high cliffs and deep gulches, natural outlooks and hiding places, and as we looked far out at sea no vessel could come near her port without being seen. As we looked into the faces of some of the inhabitants we felt sure there would be many pirates today were they not under the restrictions of law. Algeria is the richest possession of France, so that we felt we were having a small taste of that country and the Boulevard de la Republique is said to be as handsome as any in Paris. It certainly was magnificent. The gardens were dense with the tropical growth. From the summit of the hill was a glorious view of the city and the sea. Behind the walls are beautiful palaces or buildings that we caught glimpses of as we passed along. The tiling set into the walls and floors is very handsome, and marble columns are common.

Our first stop was at the Governor's palace. We were fortunate to be admitted to the grounds and were conducted through by a pretty French girl, but were not allowed inside the building. The walks were of fine clean gravel that was almost like sand, but each grain a distinct little pebble in itself. Smilax and myrtle grow to such perfection it is hardly recognized. The young lady led us to a yard where a half dozen gazelles were confined, and the graceful creatures put their front hoofs on the wire netting and ate out of her hand. Looking up to the front of the palace, one wing seemed to be a single plate of glass and we could see a marble figure with arms stretched inward and imagined we had a glimpse of a splendid art gallery. Our next stop was at the museum. It is much like all museums, but there is one sacred relic that belongs to Algiers alone, and that is the plaster cast of the Christian martyr Granimo. This man had his arms pinioned behind his back and he was thrust into a wall, and solid masonry hid him for more than three hundred years. In 1853 his body was discovered and this niche was filled with plaster paris, and thus a perfect cast even to the smile on his face was obtained. A tablet with the inscription "For Jesus' Sake" is at his head. This is one of many that suffered in those cruel times.

Coming back to the Moorish quarters, a guide cautioning us to be careful of our pocket books, led the way. Climbing up through narrow streets, not more than six feet wide, winding through tunnels, going down steps, we wondered where in the world we were, and how would we get out. One half of that journey would have satisfied us and we were tired holding our breath. Little boxes of rooms in the side of the wall where were displayed a few loaves of bread, oranges, fried cakes, beans, etc., or, perhaps, it was a shoe maker's shop. Then there was a glimpse of long, dark rooms where men lay around a table, smoking and playing cards. I cannot describe the dress or looks of these people, it was all so bad, but we were finally ushered into the open air and right on the borders of



(1) Moorish Mosque at Algiers. (2) On Neutral Ground, Gibraltar. (3) Governor's Palace, Algiers.

these quarters was a handsome Catholic church, and a few stops further on a large Mohammedan mosque. The latter is the one of interest; when we got to the entrance we were met by a boy and a man with an armful of red morocco slippers. We were not required to take off our shoes, but no one is allowed to carry the contamination of the street inside the sacred walls, so our feet were thrust into the slippers and we were allowed to proceed. Heavy velvet carpets were stretched between the columns and not a speck of dirt was seen upon them after we left the door. It was light and spacious. At one side was a class of men studying the Koran. Here and there a worshipper knelt, bowing till his forehead touched the floor. We were besieged by beggars at the entrance as we left, which was really a foretaste of what confronted us throughout our journey. This was our first glimpse of Arabs and veiled women. We now looked around for a hotel, and were directed to the Oasis. It was indeed an Oasis, elegant in all its appointments. It reminded us of the World's Fair. The ceiling and side walls of the dining-room were mirrors, and you saw yourself and others whichever way you looked. We enjoyed the rest and the cooking was fine. The short afternoon was spent visiting the shops and we wished for a pocketful of money to spend in Algiers, but we were just starting out and had many cities to visit, so our backs were turned on the beautiful articles displayed for our admiration and we were paddled back to the "Grosser Kurfurst"—always the largest and handsomest vessel at the dock. We were the largest body of Americans that had visited these cities since the days of Conquest.

Written for THE CLAY-WORKER.

PHILADELPHIA BRICK NEWS.

The new Perkiomen plant of the Montello Brick works secured the contract for 16,000,000 of brick from the John Wanamaker department store, straight side-cut shale brick made on Chamber's side-cut machines, with the aid of Chambers' pug mills and Chambers' suspended dry pans. There are four of Chambers' largest brick machines on this plant, and ten of their all-iron and steel suspended patterns, 9-foot pans.

The brickmakers on the West Side in Philadelphia have had good demand all season at satisfactory prices, and every one expresses themselves as well pleased with the season's operation. The indication now is that practically no brick will be carried over.

The trade across the river in Camden is reported to be very good.

The new plant of the Laurel Clay Products Company, near Washington, D. C., for which Chambers Bros. Company supplied machinery and dryer equipment, has been completed and they are now delivering the brick on account of the contract for the new Union Depot at Washington, D. C.

The Baltimore Brick Company increased the capacity of their East Side plants by the addition of two new Chambers machines during the past summer, and on two of the yards have placed artificial dryers.

Chambers Bros. Company is delivering an equipment of machinery and dryer to the Excelsior Brick and Pottery Company, over on the west side of Baltimore. This plant is now being placed in position.

In an interview with Howard Chambers, manager of Chambers Bros. company, he said: "Trade is comparatively quiet, and has been for the past two months. Up to two months ago we were busy, and the volume of business was fully up to the average. Within the past week our correspondence shows some renewal of inquiries, and indicates, we think, a better promise of business this fall. We are now preparing an outfit for shipment to Montana." They have made marked improvement in their automatic end-cutter, and have placed four of these cutters in operation in different ports of the country, receiving the most favorable reports from all of them.

A. QUAKER.

If you are looking for cheap machinery, scan THE CLAY-WORKER'S "For Sale" ads,

By The Light of the Kiln Fire

"GOOD BYE, DEAR OLD DAVID.'

LET ME REVERT to David Barker again. Some say that David was a mere doggerel blacksmith. Others say: "Barker's verse fill every requirement of poetry. They come from the soul and appeal to the soul." I don't take sides in the controversy. But here and there David speaks in his plain and simple style sentiments that I feel and can't express. David was a lawyer in his time and giving advice grew to be a habit with him. But his advice was good; much better than the recompense it received. Here's a bit of his instructions that costs nothing but contains an ocean of good, if followed. It is "Act Yourself."

"If you ever act at all,
Act yourself.
Never try to ape another,
Sink or swim, or rise or fall,
Never imitate, but rather,
Act yourself.

"Brains than many have you less?
Act yourself.
Each for something must be fit.
Give me native foolishness
Rather than this borrowed wit.
Act yourself.

"Elephants should never dance.
Act yourself.
Turkeys should not try to hound,
Women should not wear the pants,
Man should never wear the gown.
Act yourself.

"Forms or fashions never heed.
Act yourself.
Talk of fashions, for a man!
Copies never did succeed,
And mere copies never can.
Act yourself.

"Human nature wants her way.
Act yourself.
Out upon the tricks of art,
When you have a word to say,
When you take the simplest part,
Act yourself."

And kindly David not satisfied with leaving the needed prescription induces us to make use of it by showing the success of one who Acted Himself.

"Come, dwellers in this mortal tent,
Just step aside and see
The cold and fleshy tenement
Where dwelt poor Billy Dee.
When Billy's house grew old and poor
From Life's rude storms and wind,
He battered down the outer door,
And left the shell behind.
But in that land where Billy went,
Each kind and generous brother
Gave something from his spirit tent
To build Billy another."

And now, having proven the efficacy of following his advice, David gives us some opinions on matters and things, that no decision or decree the law counts have yet rendered can equal.

"That girl in her silks, gadding down through the streets,
And prating small talk with each fool that she meets,
Had better be helping her poor jaded mother
Fixing patches on pants of her father or brother.
I think so; don't you?"

Most assuredly we do, David. But——

"That fop whom you see with that "brow" on his lips,
Who sports a glad stick and a mint julep sips,
Would do well to learn there are a thousand worse woes
Than hats out of style and an old suit of clothes.
I think so; don't you?"

Yet, David, we think we do. But——

"That weak, silly man, whom his neighbors defame,
Who comes into court to get salve for his name,
Will find, when his lawyers are taxing the cost,
The fees are worth more than the character lost.
I think so; don't you?"

Indeed we do, dear David, and this——

"I've noted some matters and things as they passed,
And tender this legal opinion at last:

'Tis best to be honest and always content,
And keep your books straight for the last settlement.
I think so; don't you?"

Aye! that we do, David. But we've noted these things as we passed and we find your legal opinion, while it is rich in ideality and virtue, it is a thing mighty difficult to follow. The bookkeeper is born, not made, and poor human nature grows weary and absent-minded so frequently in the straight and narrow path. On the whole I would advise doing business for cash. Wouldn't you?

But now to the back-biter, the cannibal, the slanderer.

"Do the fools around you prate?
Let them talk.
Shape your course and follow through.
Never grumble at your fate;
Fools have nothing else to do.
Let them talk."

Of course we are obliged to David, but a little grumble now and then relieves the pressure.

"Heed not leakings at the mouth.
Let them talk.
Think and act the best you can.
Leaking long will bring a drouth.
While you do your duty, man,
Let them talk."

Yes, David, but we've looked for a drouth in the woman next door until all signs have failed and she still leaks.

"Never mind, but jog along.
Let them talk.
Idle talk is only gas,
Nothing but a foolish song,
Coming from a human ass.
Let them talk."

True, David, but our meter tells us gas is very expensive stuff.

"While you have an honest heart,
Let them talk.
While you utter what you mean,
While you act the manly part,
While you keep your conscience clean,
Let them talk."

We pray God give us the honest heart, David! We need it. But it is the man who says what he means these days who loses his friends and finds himself in the mud, while his neighbor, who steers his bark by the light of diplomacy is elevated to the Deity. But——

"What of That."

"Is your life a life of care?
What of that?
Toiling ever through you are,
What of that?
Since the moment of the fall,
Want by *labor* hath been fed,
And a man to breathe at all,
Should exchange his sweat for bread.
What of that?"

That seems to describe the clayworker's standard of living, doesn't it?

"Is old slander on your track?
What of that?
Slyly prating at your back?
What of that?
Let no slander shake the nerve,
Straight and forward on your way,
Never for a moment swerve;
Never waste a step to say,
What of that?

"Jealous envy do you spy?
What of that?
Envy with a jaundiced eye?
What of that?
Mind me—she's too far below,
Like a viper robbed of sting;
Rising, ever, as you go,
If she hisses, calmly sing,
What of that?

"Is the crowd around you wrong?
What of that?
Are you jostled by the strong?
What of that?
Time will straighten matters right,
Better far than mortal can;
Truth has often crouched to might
Ever since the world began.
What of that?

Aye! true, David! Time will straighten matters right about the time the undertaker straightens out our toil-bent backs to jam them into their last "resting" places as time did for the old folks of whom you sing with heavy mists before your eyes as you write.

"I shall never tell who the old folks were,
'Tis a wasting of time and breath
To give you the names of the humble pair
Who have passed to the counts of death.
But the cot on the lot on the top of the hill,
Near the spot where I sat and cried,
'Tis the lot where the old folks toiled and lived,
And the cot where the old folks died,
Is dearer far to my weary heart
Than the rarest spot on earth,
For that was the cot on the lot on the top of the hill,
Where the old folks gave me birth.
There's a slab near the cot on the top of the hill,
That tells to the traveler there
When the old folks passed through the gate of death.
And the names of the humble pair.
When I tire of the toils and the cares of life,
Oh! then at the spot where I cried,
Near the cot let me sleep on the top of the hill,
Cuddled down by the old folks' side."

And now I am almost through, but I cannot leave my David in tears. I like to finish the sketch with David standing bravely and manfully facing his fate and his duties as beseemed a strong character. So away with sadness and death and—

"Up, up and give fight to the legions of wrong;
Give zealots and bigots the lie,
Who cantingly tell you, with faces so long,
That all should get ready to die.
This world is too full of your dying ones now,
And we need in this terrible strife
Not souls that are panting and fainting, I trow,
But souls that have vigor and life.
While a lift at humanity's wheel you can give,
Or a tear you can wipe from your eye,
Get ready, my brother, keep ready to live,
But never get ready to die."

But the hour is late, and to your gentle features that seem to smile at me through the glory of the kiln-fire I must say, "Good night, dear old David." THE DREAMER.

OBITUARY.

Brian J. Dunn, Bangor, Me.

Again we are called on to chronicle the death of one of our faithful contributors, Brian J. Dunn, Bangor, Me. His death occurred Saturday, October 1, after a short illness with typhoid fever. A wife and three small children survive him.

The Late Brian J. Dunn.

Brian J. Dunn was born in Brewer, Me., June 14, 1863, where he received his early education, and then entered upon the study of law. Serious trouble with his eyes made it necessary for him to seek other lines, and he went to work in his father's brickyard, where he became an expert and gained an insight into the trade that made him an authority in that section. Later he took up newspaper work, in which he was very successful, being at different times identified with leading newspapers of Boston, Worcester, New York City, and Elizabeth, N. J. Notwithstanding his success in this field, he turned again to the study of law and graduated from the Boston School of Law. He was admitted to the Massachusetts bar, and after practicing law for a time in Boston returned to Bangor, where he had established himself permanently.

Mr. Dunn was well known to the readers of THE CLAY-WORKER through his entertaining sketches published under the title "By the Light of the Kiln Fire," and his clever verses, signed "A Dreamer," and many of them will feel a personal loss in his death. He had been a member of the N. B. M. A. for a number of years, and while he never attended but one convention, that at Boston, he had rendered very effective service in his own and the adjoining states. Mr. Dunn's genial, cordial nature won for him a host of friends wherever he went, and his untimely death will be mourned not alone by all who knew him personally but by many who have grown to love him through his writings of prose and verse.

Written for THE CLAY-WORKER.

BRICKYARD SNAP SHOTS.

This title is possibly a bit misleading, but, after all, it conveys in a general way what the writer wishes to convey. A few days ago, with camera in hand, he strolled down to some of the Hackensack yards with a view to showing some of those who take THE CLAY-WORKER elsewhere how seriously the rain damaged the brick that were drying. But the workmen objected, and there being several of the workmen and only one of the "camerist," discretion was considered the better part of the game, and a retreat was made to a point at some distance from the scene of the encounter. Unfortunately, unlike the Japanese, the persons who raised the objections did not follow, and the appearance of that yard with the half-melted brick, still remains to be recorded

It is a fact, however, which the employes of manufacturers cannot disguise that the brick which laid out during two or three heavy showers suffered severely. So far as the writer could see, they had no corners on them, at least those which were exposed.

A Jersey Clay Pit Filled with Water.

Perhaps others were less seriously damaged. It must have caused a great loss, and the makers are certainly entitled to the sympathy of the entire trade. They have had hard luck here the past year, and it is small wonder that some have become discouraged and do not care to continue under such poor conditions.

The market has become better of late and shipments have been liberal. Schooner loads and car loads are leaving frequently, while prices are fair, yielding a reasonable profit. Had there been no losses from storms, the conditions would have been still more favorable. The outlook for next season is even more promising.

A few snap shots of the yards, or one of them, may not be uninteresting. The views shown were made about the yards of M. & I. E. Gardner, one of the oldest in the business. It will be noted that the pits are full of water, the view showing the roadway between them, representing the condition very well. One is an old pit and is abandoned. The other has not been pumped out recently, the clay at present being obtained elsewhere.

A good deal of additional expense is incurred about all the Hackensack yards because the pits are below the level of the water in the river at high tide. Where the clay is solid there is little difficulty, but in some instances the clay is overlaid by a spongy or sandy loam, through which the water percolates. The violent rains this season have kept the pits well filled, which has caused considerable additional expense in pumping, and now rains have even damaged the brick which are almost ready to be burned.

Sand, good sand, is an essential of good brick. Fortunately, the geographical formation about the Hackensack yards is such that ample supplies of sand are easily obtainable. It has the life necessary to mix well and, in most instances, requires no cleaning. The sand, laid down in still water, was relieved of all its impurities before it was deposited. A knoll, called "Sand Hill," is being gradually dug away to supply the sand for the yards near. It is clean, white and of the proper consistency. The result is that exceedingly good brick are easily made.

For more than seventy-five years, there have been brickyards at Hackensack. They are still working in clay pits which show no indication of exhaustion and which are yielding quite as good clay as when they began. Another seventy-five years will show scarcely any more signs of exhaustion. The beds are fully one hundred feet deep here, and they are worked only in a small way, comparatively speaking, though the total output runs into tens of millions.

Good Sand and Plenty of It.

BURTON.

AS OTHERS SEE US.

Of all the trade journals in America devoted to a single phase of the building or building material industries, not one within the pale of our observation equals for quality and variety of information and news of its field THE CLAY-WORKER, "A journal for Brick and Tile Manufacturers, Potters and All Workers in Clay." It is edited and published by T. A. Randall & Co., Indianapolis, and is the official organ of the National Brick Manufacturers' Association. Its contents prove that a monthly periodical may also be a newspaper.—*New York Building Bulletin.*

For cheap machinery the reader is referred to our "For Sale" columns. We do not advise the purchase of cheap machinery. As a rule, cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted," "For Sale," etc., columns a means of satisfying their needs.

CLAYS OF THE OHIO VALLEY IN PENNSYLVANIA.

THE CLAYS of the Ohio Valley in Pennsylvania are discussed by Mr. L. H. Woolsey in an article recently published by the United States Geological Survey in Bulletin No. 225, entitled, "Contributions to Economic Geology, 1903." This report is presented as a result of field work on the Beaver quadrangle, Pennsylvania. It contains not only information concerning the clay industries of this region but also analyses and notes of clays of other districts, presented for purposes of comparison.

Beginning with a discussion on the nature of the clay, Mr. Woolsey proceeds to classify the clays of the Ohio Valley into Carboniferous clays, or those found in consolidated rocks of Carboniferous age, and Quaternary clays, or those found in the unconsolidated glacial and river deposits. Under these heads the clays of the various formations are described in detail.

The clay industries along the Ohio and Beaver rivers may be classed according to products as follows: Pottery, tiles, sewer pipe, refractory materials, building materials, and paving materials. A brief description is given in the establishments in this area for the manufacture of these various clay products.

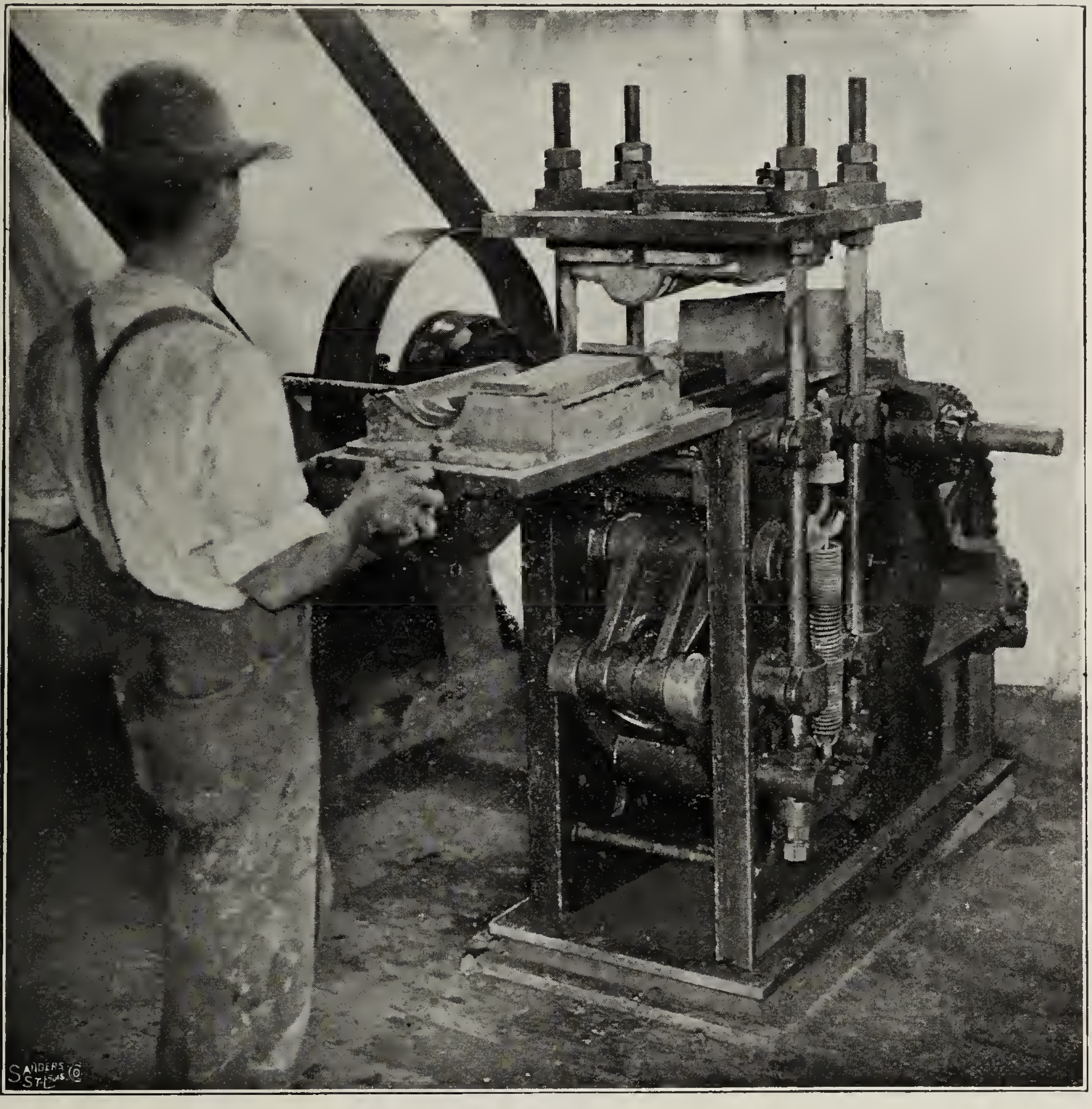
In the clay industry of the United States, Pennsylvania ranks second, with a product of over $17,000,000, which is 14 per cent. of the total product of the United States. This State holds first place in the United States in the manufacture of firebrick and building brick, making one-half of the total product in firebrick and over one-seventh of the building brick. The pre-eminence of Pennsylvania in the firebrick industry is probably due to the extraordinary demand for refractory materials within the State itself. As it is the chief iron producer of the United States, it has need for enormous quantities of firebrick, fireclay cement, and other refractory products, which are used in the manufacture of linings for blast furnaces, of crucibles, and of other articles employed in metallurgical processes.

Of the total Pennsylvania production, Beaver county supplies a considerable part. It produces 29 per cent. of the Pennsylvania pottery (all made within a radius of a mile and a half from New Brighton), 30 per cent. of its paving brick and 25 per cent. of its fancy or ornamental brick, 16 per cent. of its firebrick, and about the same proportion of sewer pipe fireproofing and tile (not drain). But of building brick it supplies the least percentage, only 4 per cent. of the total amount manufactured in the State. Of the total clay products of the State, Beaver county furnishes 5 per cent. This is a small percentage of what the county could produce if its clay deposits were developed as are those in Ohio, which are practically the same as the Beaver county deposits. Further development, however, is greatly impeded by lack of transportation facilities. This is especially true along Ohio River west of Beaver river, where the valley affords but one single-track railroad, characterized by an embarrassing scarcity of cars. The river is unnavigable for a great part of the year.

The bulletin, which contains Mr. Woolsey's article, is published for gratuitous distribution, and may be obtained on application to the Director of the United States Geological Survey, Washington, D. C.

A NEW ROOFING TILE PRESS.

We present a cut of new Roofing Tile Press, which is also used for hips and ridge tile, as well as other roof tile. This press is in successful operation at the Mound City Roofing Tile Company's plant, at St. Louis, and is giving the best of satisfaction. It has a capacity of from 1,000 to 2,000 tile or trimmings in 10 hours, runs noiselessly and is started and stopped instantly. It is the invention of Mr. W. P. Grath, of the Illinois Supply and Construction Company, 327 Odd Fellows Building, St. Louis, Mo., who will be pleased to give further information. No roofing tile plant is complete without this press. See ad. on page 406.



Grath's New Roofing Tile Press.

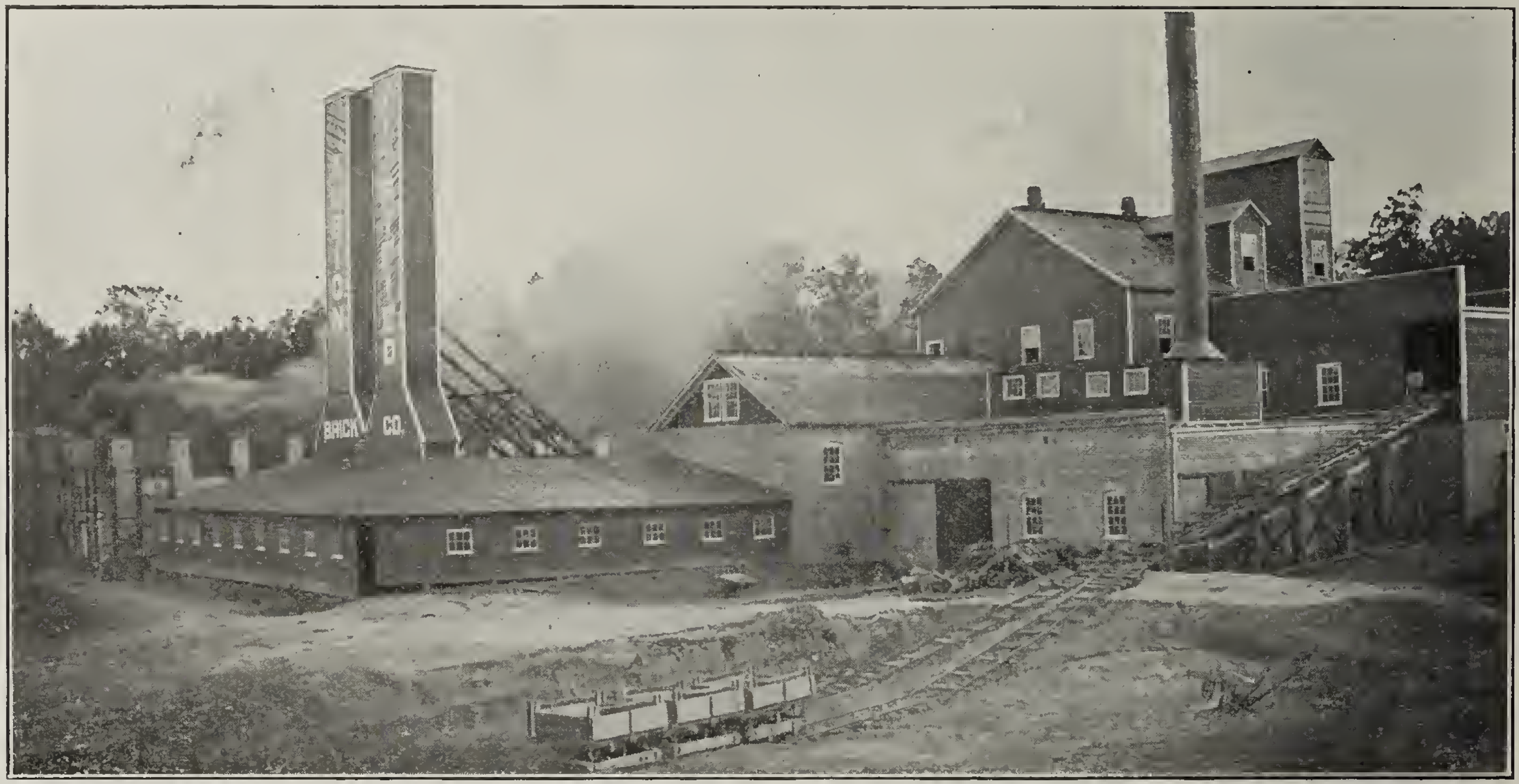
THINKS UNIONISM MONOPOLY.

Monopoly—that is the central aim of trade unionism, says the Los Angeles Times, as it is misconducted under existing industrial conditions. There is no getting away from the fact and no evading its meaning. Monopoly is no more to be commended, supported or defended when it is sought by combinations of workmen than when it is sought by combinations of capital. In principle and purpose it is inimical to the public interest, for it seeks to confer upon a few favored persons advantages and benefits which are not within reach of the many.

Written for The Clay-Worker.

THE MANUFACTURE OF PAVING BRICK AT ALBION, ILLINOIS.—AN UP-TO-DATE PLANT IN ALL RESPECTS.

THE NEW PLANT of the Albion Vitrified Brick Company, located on the line of the Southern Railway at Albion, Illinois, although not one of the largest is believed to be one of the best equipped establishments of its kind in this country for the manufacture of shale pavers, sidewalk and sewer brick. The buildings are very substantially built and an attempt was made to procure only the best machinery. The foundation work was begun early in the spring of 1903, and the first kiln of sidewalk brick was opened at the beginning of November. The buildings have an extreme length of 170 feet and a width of 115 feet. The engine and boiler rooms, dryer buildings, off-bearing room and clay storage room are constructed wholly of brick, while the walls of the main building are also brick up to the height of twenty feet, the whole very substantially constructed. The dryer building, equipped with the Barron steam dryer apparatus, is 32 x 170 feet and contains four and two-thirds miles of steam piping, with a steam radiating surface of more than 30,000 feet. The machinery of the plant comprises one 777 Raymond brick machine; one automatic down-cut shear-cut cutting table; one No. "O" compound geared 12-foot Raymond pug mill; one nine-foot Raymond dry pan with 52-inch mullers; one set cup elevators 48 feet between centers; Victor double die represses; one largest size Dunlap perfect clay screen; one 207-horse-power Erie City automatic engine and two 125-horse-power Erie City water tube boilers. One hundred and forty double deck steel dryer cars are used of the Atlas manufacture. The Bushong down draft kilns are employed. These are of sufficient capacity to hold each 165,000 builders, being 19 x 86 feet.



General View of the Plant of the Albion (Ill.) Vitrified Brick Company.

The plant is located at the base of a hill of shale which the track of the Southern Railway opens up to a depth of fifty feet. The surface consists of four or five feet of yellow clay which makes an excellent building brick or works advantageously in combination with the underlying shale. The upper stratas of shale are yellow or gray, and the lower beds are blue. All of this contains a plentiful supply of silica. The deposits of shale have been drilled to a depth of more than 600 feet without finding the bottom. The first kiln of brick burned, a motley mixture, running from pure yellow clay to pure blue shale, was a perfect success, there being scarcely an unsalable brick in the entire kiln, and all of them being excellent for sidewalk use. The shale vitrifies splendidly in six days from time of firing, thereby producing an economical burn. Up to the present time only sidewalk and sewer brick have been manufactured, but the manufacture of paving blocks will be undertaken at once, and a little later on fancy enameled sidewalk brick will also be made. The present capacity of the plant is 40,000 a day, but by the use of live steam during the day time and the addition of a little more machinery the output might be doubled. Water is supplied from a reservoir containing 3,000,000 gallons. In addition to the railroad right of way through the hill, on either side, given to the brick company, the company also owns eight and one-half acres of land underlaid by sufficient shale to build a wall all around China.

The Albion Vitrified Brick Company is a home enterprise, and the stock is principally subscribed by home people of moderate means. Although without experience in the paving brick business, before undertaking the building of a plant, a committee of four visited many of the most successful factories in this country gathering information which was afterward utilized to good advantage. The company is officered as follows: Dr. J. H. Lacey, president; Dr. W. H. Brosman, vice-president; Walter Colyer, secretary; B. F. Michels, treasurer. The factory is being most successfully operated under the superintendence of Mr. M. M. Bushong, of Pennsylvania, inventor and patentee of the Bushong kiln. The kilns of the plant were also constructed under his immediate supervision.

The accompanying illustration shows in a general way the arrangement of the buildings, which are believed to be well nigh as convenient as could easily be planned. On top of the hill above is located a ten thousand gallon reservoir kept full of water. A three and one-half inch pipe runs to the plant and connecting pipes and hose afford means of throwing water to all parts of the building in case of fire. The plant is also supplied with a 700-foot railway switch and several thousand feet of light rail tracks.

The promoters of the enterprise are determined to succeed and the conditions and surroundings are such that there is a reasonable assurance they will do so. This plant is the most southern in Illinois and occupies a new and heretofore unoccupied territory in the paving brick industry. Being located midway between the important cities of St. Louis and Louisville the product can be marketed to advantage in both. The Southern Railroad, which regards this as one of the most promising enterprises on its entire system, has been very generous in its assistance rendered.

Written for The Clay-Worker.

MODEL BRICK PAVEMENT IN CHICAGO.

THE progressive citizens of Chicago are setting an example which other American cities will do well to imitate. They have been investigating the paving question as a whole, with the purpose of greatly improving the thoroughfares of the city. Among other plans approved for the betterment of the street conditions of that city is the construction of a "model brick pavement." Justly and wisely the Board of Local Improvements has gone to the proper source for the model brick pavement, viz., the people who manufacture paving brick. Any other course would be unjust to that branch of the paving industry. The city authorities were fortunate in getting Mr. D. V. Purington, president of the Purington Paving Brick Company, to lay this strip of model brick pavement, because he has had many years' experience in the manufacture of paving brick and the requisite knowledge of how to lay it.

The thoroughfare turned over to Mr. Purington for the purpose of demonstrating to the people of Chicago the practicability of a properly laid brick pavement is the east half of Lasalle street, from Washington to Madison streets. In front of the Chamber of Commerce, this is easily one of the busiest thoroughfares in Chicago. It is exposed to hard traffic six days out of the week. The brick pavement which Mr. Purington took up had been down ten years, during which period it had been torn up just eighty-four times for repairs. Mr. Purington says he fully expects the new pavement to be just as good in ten years as it is to-day. The result will certainly be awaited with considerable interest, both on the part of brick manufacturers and paving contractors, as well as all citizens who have the welfare of their town's pavement at heart.

Mr. Purington is correct in his assertion that the very best brick made will make a very poor pavement unless it is properly laid. It was for the purpose of demonstrating that brick properly laid will make an ideal pavement that Mr. Purington obtained permission to use a section of busy Lasalle street to carry out his ideas. With this object in view his first care was to send to Terre Haute, Ind., for Mr. George R. Grimes, civil engineer of that city, and enlist the latter's service in the Chicago demonstration. Mr. Grimes is the man who supervised the construction of Terre Haute's many brick pavements, which are regarded as the finest of their kind in the world. Under Mr. Grimes' supervision, Mr. Purington's sample street was completed September 3.

In constructing this model pavement Mr. Grimes has observed his own methods of dealing with the seven vital principles of brick street laying, as follows

1, Sub-foundation, commonly called grading; 2, curb setting; 3, intermediate foundation of concrete; 4, rolling of brick sand cushion; 5, laying and rolling of brick; 6, provision for expansion and contracting; 7, filler.

The only departure made from Mr. Grimes' regular rules governing the laying of brick pavements was in the foundation. It was only intended to use a six-inch foundation, but as the gas company had just dug up and replaced this street for the purpose of calking mains, it was thought wise to put in an eight-inch foundation. Great care was used in rolling the brick. The work was done entirely by hand. A cement grout was used in filling. After the pavement was in, brick were taken up in two or three spots. It was seen that each brick had become imbedded in the sand cushion, the sand oozing up between each joint, to be met squarely by the grout filler, thus firmly cementing the pavement together and bidding fair to confirm Mr. Purington's fond expectations of the street.—*Municipal Journal and Engineer.*

Snap Shots at the Albion Vitrified Brick Company's Plant. (1) The Clay Bank. (2) A Car of Dry Brick on the Way to Kiln. (3) Getting in a Supply of Coal. (4) Between the Kilns.

LAND DRAINAGE

BY J. J. W. BILLINGSLEY

A VERY SIMPLE THING.

IN THE TILE drainage of land, it does seem to be a very simple thing to some people. All there is of it, as they look at it, is to dig a ditch, so deep, and lay tile in it, and then fill up the ditch. That is all. If that is all, "it is a very simple thing." But, fortunately, there is much more in the way of needful information pertaining to the business. So much more, that one who has only this limited view of the work, needs to learn much more about it before he undertakes to drain. He needs to know what is being done, how it is done, and the result of the doing. No man can hope to discover all the best methods himself—it is not possible. Different minds will have different thoughts and apply different methods. In the years gone by it was thought sufficient to dig a ditch twenty inches or two feet deep and lay the tile and fill the ditch. Others have dug deeper, and had better results. Others have thought out the reasons why the deeper drainage is necessary, and then have worked out their thoughts in a way most satisfactory. So we cannot hope to keep up with the progress which is being made in any line of business unless we are careful to keep posted as to the best methods and practice of others. A thing may be very simple to us, and we may be very simple, in the want of better information about it.

SOIL THAT NEEDS TILE DRAINAGE.

The unfavorable condition of our soil is such that if we have a little too much rain our crops are drowned out, and then, in two or three weeks afterwards, are apparently suffering from want of the same moisture. This is the very kind of soil that needs draining most, for a soil retentive of moisture, when drained, becomes more productive than a similar soil naturally drained. We all know the capabilities of our soil by the splendid crops produced of years following extreme dry years. By the thorough drainage of our soil and systematic cultivation, similar crops could be grown almost every year.

DOES DRAINAGE PAY?

"Does drainage on a large scale pay?" If we put the question to individuals who have land which is being taxed for public drains, "Shall we give you back your money and take out the drains?" the answer is "No," and this, too, with only two years' experience with the drains. A few years ago drainage commissioners had a great deal of trouble in laying out and setting the stakes for the drainage of Beaver lake. The people threatened them with violence. The commissioners acted wisely, and finally succeeded in accomplishing the work of their mission, and the construction of the drains was completed in twelve months. Five years after, one of the commissioners visited the locality where Beaver lake used to be located, and the two or three thousand acres forming the basin of the lake were in corn, and the land owners were delighted with the results of the work the commissioners had laid out, almost perilling their lives to do it. Mr. B— was gladly received by the good people and most royally entertained and heartily thanked for his courage and labor. Land that had a nominal value of $5 per acre before being drained, since being drained and brought into cultivation is held at $100 per acre, on account of the marvelous crops grown and harvested. So it is, wherever these waste lands are reclaimed, the owners and others with glad acclaim say, "It *does* pay."

BETTER THAN OPEN DITCHES.

It is a mystery to some people how and why a few pipe laid in the ground can accomplish so much more than open ditches of many times more capacity. The surface of the open ditches soon become puddled over, which prevents the water from entering the ditch freely through the soil. The water, passing over the surface of the land, enters the open ditch freely and passes away, taking with it soil fertility, vegetable matter and the finer particles of soil which is a great help to the future fertility of the soil. The under or tile drain works better the longer it lays, or, in other words, works better as it gets older. The wonderful power of a tile to relieve the soil of surplus water, rendering the soil arable and open, is the fact that it is always on duty.

FACTS AND FIGURES.

One of my neighbors has a thirty-acre field that he has cultivated for fourteen years, in what is called the "Horse Swamp," that, until lately, has had but little or no draining done on it. He has tended it most in corn, has made three fair crops, and has had four entire failures. Taking the whole time, his average has been about twenty bushels per acre. Another neighbor whose land lays but a short distance away, and is of the same nature, has partially drained his land with open ditches, has made an average of forty bushels per acre for the time mentioned above—a difference of twenty bushels per acre on land naturally the same.

From our experience with tile draining, I believe if the land which was partially drained with open ditches had been thoroughly tile drained, it would have produced from ten to twenty bushels more per acre than it did—say thirty-five bushels more per acre than the first field mentioned. This amount of corn, when sold at 40 cents a bushel, which is about the average price of corn during the time (fourteen years), would amount to $5,880. Reader, you think there must be some mistake—figure it up and you will be surprised. There are millions of acres of land that would be alike benefited if thoroughly tile drained.

F. M. B.

AN ECCENTRIC SEASON.

Those engaged in the manufacture of drain tile have found that the season has been remarkable for extreme changes—dry and wet unexpectedly; cool, with now and then a change to warm weather, with extremely warm weather in September. The air at times has been so full of water vapor as to make the drying of tile very difficult. In fact, the whole process of manufacture has been affected by the weather changes, more or less, with few exceptions.

LONGER TILE.

They should be made not less than two feet long, and large tile intended for main drains may be longer. Tile of such length can be more evenly laid, and will thus offer less resistance to the flow of water through them than those only one foot in length, generally used. But one asks, "Where will the water get into the tile when such long tile are used?"

It may be a little impertinent to reply that the water will get in at the joints. Moreover, the tile should be closely jointed. "How can the water get into the tile when such excessive pains are taken to make the joints so close?"

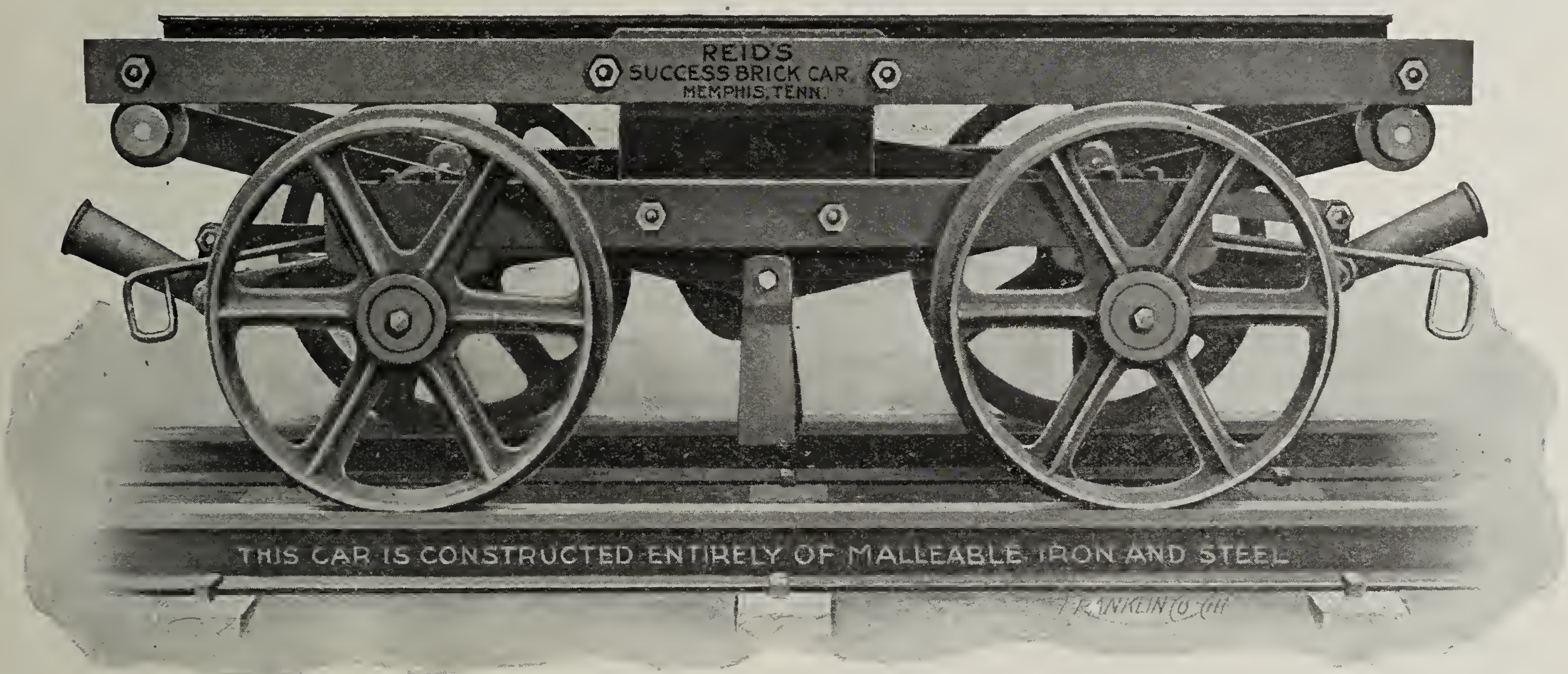
Go to the point of discharge of such a line of tile drain after a good rainfall and there will pour from it such a strong stream of water as to convince at sight that there is no trouble about the water getting in at the joints of the tile. Tile two or three feet in length are more easily laid, and, when properly adjusted, form a better conduit with less obstruction to the flow of water in the drain. OPDYCKE.

FIRECLAY BLOCK FOR ARCHES AND BAGS.

Their Advantage Over Standard Size Firebrick.

EVERY ONE WHO uses kilns for clay burning has an idea of the enormous expense in keeping the arches and bags in repair. An arch turned out of more than one brick in length opens up after a few burns and arches are going down and going up at an expense, which (if kept a record of all over the country where kilns are used) would astonish the average clay-worker; an expense which amounts to millions of dollars, a large percentage of which could be saved annually by using arch-blocks, molded in one piece only, consequently no joints to open up to let the fires go between and burn out the arch and finally cause it to collapse.

The blocks are molded in the shape of a standard arch brick, side-wedge or end-wedge, in the proper size to turn a half circle arch. Suppose a firehole is twenty-two inches wide, it takes ten blocks to turn an arch with an eleven-inch rise. Any one can figure out the proper dimensions of the blocks necessary to turn such an arch. An arch made of blocks will outwear one of standard nine-inch firebrick as much as sixteen to one.


REIDS
SUCCESS BRICK CAR.
MEMPHIS, TENN.
THIS CAR IS CONSTRUCTED ENTIRELY OF MALLEABLE IRON AND STEEL

Reid's Success Brick Car, Manufactured by the Success Brick Machinery Company, Memphis, Tenn.

The blocks may be a little more expensive in first cost, but they will be cheap in the long run. Not only for arches in fireholes can these blocks be used to advantage and as money-savers, but also in turning arches over underground flues, especially stack flues. They can also be used for door-arches for kilns. It makes no difference how neat and workmanlike a door-arch is put up, it will open up, part at the joints from the weight of the kiln-crown, while by using blocks molded in one piece it will strengthen the kiln right at the weakest place—in the door.

BLOCKS FOR BAGS AND FIREHOLES.

We know the less mortar joints we have in a bag or in a firehole the longer they will stand. Bags built of nine-inch firebrick will not stand half as long as those built of large blocks. This is an established fact and can be seen at the mammoth sewer-pipe and firebrick works of Montague & Co., Chattanooga, Tenn. They have been in business thirty years, and they know something of the kiln-repair expenses. They are using large blocks now exclusively for their kiln-door arch fireholes and bag-walls, and the repair expenses are reduced to the lowest possible figure. Good judgment, practical sense (of which they have an abundance) and economy in trifling matters are factors which save them big money, which is a most important medium.

The advantages of large fireclay blocks are too numerous to mention. They can be used for lining kilns, it takes less mortar and labor to lay them (a great item and money-saver), and why the kiln-walls are built two or three feet thick and the crowns only nine to twelve inches thick, including the covering, I am at a loss to understand. It is violation of natural law. Why should not the crowns at least be as thick or rather thicker than the kiln-walls? Does not heat naturally go to the top? Why not, then, build the kiln-crowns thicker, so as to prevent losing so much heat by radiation? Large blocks of the right shape are better than the smaller standard size brick, because there will be less joints to open up and crack the crown, they will keep the heat better and not burn out so quickly. But, will they not be too heavy on the strain of the bands? No. The first burn may cause a tremendous strain on the bands, not caused by the weight, but by expansion, and if the bands are properly loosened, there is no danger.

Of course, the crown must be built right, not too steep and not too flat. There are two ways of turning a crown—one is the right way and the other is the wrong way—therefore it takes a man of experience to build a good kiln-crown, and not every bricklayer can do it. It must be an expert in this line. A. V.

THE SUCCESS BRICK CAR.

Truly it may be said that this is an age of progress. Cut on this page represents what is claimed by the inventors and owners as being a perfect car for handling brick and other clay products. This car is known as Reid's Success Brick Car, the inventor, Mr. Frank H. Reid, President and General Manager of Success Brick Machinery Company, of Memphis, Tenn. The owners claim many advantages over all other cars in principle, design and quality of material used in its construction, and the manner in which brick are handled. This car is not an experiment, but has been used by a number of prominent firms who praise the car and system highly, as many as 57,000 brick being handled in a day of ten hours by one man from machine to drying sheds. Write to Success Company for booklet, "Successes of Success," and description of cars, which will be promptly furnished. The reader is requested to refer to pages 391 and 421 for their ads.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

THE YARDS along the Hudson and Hackensack rivers are having exceptionally good weather for so late in the season, in the past three weeks there being but one rainstorm. That one, however, was a hard one—some called it a gale. It began in the night and continued until seven in the morning, causing the loss of one day's moulding, which both boss and men regretted very much. A change in brickyards is certainly and surely taking place on tidewater, and it will be some years before the change will be complete, but it will come, and there will be more money go into the outfit and the open yards will be of the "has-beens." It seems that the ways of the father, because he was satisfied with small returns, does not come up to the ideas of the more progressive sons. As he goes around and looks at yards in other sections, where more modern yards are in operation, and he sees no waste to speak of, he begins to think that we will be far better off each year if we will fit up a plant which will cut down much of the handling and the waste which is now attached to making brick by drying by the heat of the sun.

A BRICK FACTORY

Will be the name used, instead of brick yard, for there is no yard to be seen, and no use for any, but, like other factories, is under a roof, and with the advent of that way of making brick, the brickyarder may be considered a human being. To-day he is classed with the gentlemen of the "horns and cloven foot," and to speak of a brickyard, some people have the idea that nothing but the lowest class was connected with that trade in any capacity.

Part of the Plant of the Kingsland (N. J.) Brick Co.

Another benefit that may attend the improvement in making brick, there will be a better class of men, as the sunrise-to-sundown way will be a thing of the past, instead a day of ten hours.

A few years back, in Bergen County, parties put up a plant which was said to be up to date, and was going to revolutionize the brick trade. But alas, the same old rock which has wrecked many other plants for the manufacture of brick, and the principal one—the stuff which was to go into the making of brick—was not given enough attention. There was some clay, but more sand. If the clay was taken in the quantity that it should, there would in a short time be a hole and no material. The enterprise lingered for a few years and then died. After lying idle all of last year, a brickmaker took hold of it and one year was enough, and more, if reports are to be believed. The market for the product of the yard is good, as all the output could be delivered in the town with wagons.

NEW YARDS IN EASTERN JERSEY

Are ready for business, and have been molding for some time. It is the only one of its kind in this part of the State. As for material, there will be no danger of the supply of material running short, no matter how much they may use. The output can be increased to any amount, and there will be no need to sink for a shovelful of material, and there is no quicksand to worry the the life out of the owners, because the material is red rock. The brand on the brick is K. B. C.—Kingsland Brick Company—located at Kingsland, N. J., and no one would suspect there was a brick plant, and a good one, and of the brick factory class.

Why is it a brickmaker is always on the outlook for a location for the manufacture of brick? It seems to be second nature to most of us. This plant just spoken of got its location from the fact that the superintendent always kept his eye peeled for just such an opening. When he, I may say, discovered this spot he was not engaged in brickmaking, but was on the railroad. He got his first sight on the bed of clay while acting as master mechanic for the road. He was doing some repair work on an engine, and at the same time there was an explosion of a small magazine in which the company kept powder for use on the road. After the excitement of the explosion he discovered that right there was an unlimited quantity of material to make brick, if it was the right sort. The beginning of negotiations to acquire a location for the plant and the material from which to make brick was not long in being started, and the length of time it took to get things in a satisfactory condition showed that the gentleman had the staying qualities which are needed in the business. It was just three years from the beginning of negotiations until the final agreements were reached.

A Portion of the Dryer.

ARRANGEMENT OF AN UP-TO-DATE BRICK PLANT.

The plant runs north and south, with the engine room on the north. The next is the part of the building in which the machinery is located. Then comes the tunnels, ten in number, the entrance to them being probably thirty feet from the machine. The dryers are 100 feet in length, the furnaces located at the south end below the dryers. The distance from the outlet of the dryers to the end of the building is about twenty-five feet. The total length of the building from north to south is 400 feet. Beginning at the south end of the building are the kilns, five in number, of the down-draft class, about ten feet apart. To the east of them, separated by a switch on which cars can be run in and loaded from kilns, five more kilns of the same style but of about ninety-thousand capacity, are located. To my back on the north part of the building is a shed under which is the crusher, and alongside of the crusher on the south side is the grinding pans. From the pans the tempered mud or rock, whichever it may be called, is conveyed by elevator up to about the middle of the building, about thirty or more feet, to a pug mill, preparatory to passing into the cut-off machine, automatic cut-off, where four boys take off and place on the cars ready for the dryer. From the crusher to the face of the bank is not over fifty feet. About the middle of the building and east of where the conveyor takes the mud to the cut-off machine, stands two iron press machines. A horizontal engine of 150-horse power runs the machinery, making 122 revolutions. The boilers are of the same power as the engine. A large engine room with engine standing from east to west, the boilers face the east and not fifteen feet from the throttle of the engine. The width of the building is about fifty feet or more, as ten dryers side by side, with a passageway the length of them of about four feet, will give any one acquainted with dryers an idea of the space occupied. The foundation is on solid rock. When the building was put up there was no trouble from settling and cracking of the walls of the dryers and buildings, as is generally the case, and it also formed a first-class floor.

The kilns are so placed that they stand in line about eight to ten feet apart. A turn-table is used to switch the cars over the switch, a short piece of track laid down to connect with the kiln across the track.

Filling crusher, it seems as if I should say, filling pit, but there are no pit shovelers in sight, only the Italians with wheelbarows with good red rock. It is as handy as one could wish. No push on the part of the wheeler, but hold back, as the wheeling board slants from bank to the crusher, and that is below the platform and the wheeler dumps his load into the crusher. There is a pile of stone at one side, ready to be thrown in, if by any means the wheelers do not keep enough rock in the crusher.

The bank from which they take the stuff is about fifty feet back from the building, and at least forty feet in height. In the engine house they put down a well and went through sixty-six feet of rock, so that there is no fear of getting short of material, as the width of the bank may be miles in extent.

New Kilns at Kingsland.

The output is 35,000 per day and can be increased if the demand calls for it. This being the first year, or one would say the experimental stage, the need of increased output will no doubt quickly grow. The brick are large, about nine inches in length, width and thickness in proportion to make them set right. I am at a loss as to how to name the men, as the open yard has a foreman, and he is king of them all, doing the burning, or having charge of that part of the business, and is the boss. In this style of yard there is a burner, who takes charge of that part of the plant and nothing else, and he has had good burns as the stock of brick shows. It has not been one or two kilns that were good and kept for sample. Some may say, how can that be done on the open yard with old style kilns? When an exceptionally nice arch is opened and well burned out, it is left standing for those who pass through the shed to look at, while they load out of other kilns.

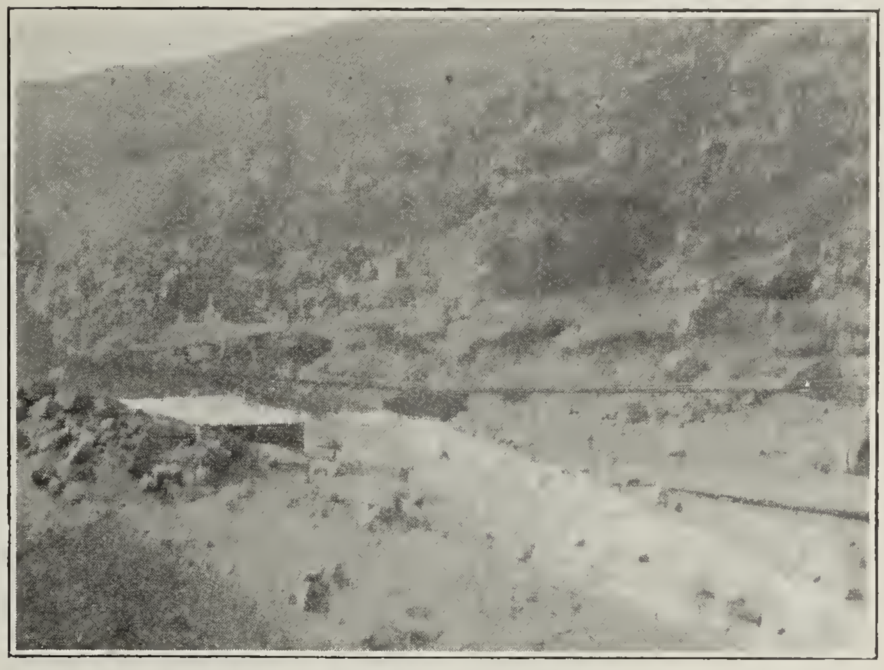
These brick are fine and they have a contract to supply 40,000 a day, when ready for them, about five or six hundred feet distant from the kilns, which will cover five acres of roof.

The shipping facilities are as handy as any one could wish for, and the railroad will no doubt use a great many along its line. I believe in the near future they are going to put in a machine to make common brick, as the cities of Hoboken, Jersey City and Newark are but a short distance from the yard with railroad connections into the plant, and the road which has a switch in the plant runs into all these cities, thus saving extra freight. It is a well constructed plant, not a foot of the four hundred feet, which are under cover, but that is made use of. Plenty of room so that all who work there have plenty of room to work in. The superintendent should feel proud of his part in the erection of such a plant, as it is plain to be seen that a master hand has spent many an hour thinking how each part should fit in with the other, to get the best results. The combination is most perfect for handiness.

THE NEW YORK BRICK MARKET

Is doing its work nicely, taking stock about as fast as it reaches the market. The shipments are rushed not because the brickmaker is contrary, but because he does not want to take the time from molding to load boats. It is not at all likely that there will be a fall in the price of brick. The brickmaker is short-handed and has kilns ready to burn, but that will take men, and he wants to make as many as he can, the season is only about a month from closing time. The rate is steady with the second-class brick close up to the best grades. From $7.00 to $7.25 and $7.37½, top $7.50 Once in a while something exceptionally fine sells for $7.62½. Just recently a sailing vessel of pale brick brought $6.00 per thousand—think of it. Three years back they would have sold for one-quarter that price, and that considered a good price.

A. N. OLDTIMER.



The Clay Bank.

PATENT SUIT.

Suit was brought Feb. 23, 1904, against the Hamilton Brick Co., of Hamilton, Ohio, by the Horton Manufacturing Co., of Painesville, Ohio, for infringement on their patent on their Hercules brick machine. The Hamilton Brick Co. is using a machine made by the Arnold-Creager Co., of New London and Cincinnati, Ohio, and is called by various names such as "S. S. S.," the "New Century," the "Success," etc. 5tf L.

"A penny saved is a penny earned." One way for clayworkers to save is to sell discarded machinery and appliances, instead of allowing them to rust and decay in fence corners. Either house and preserve such machinery, or sell it to some one who can make good use of it. There are many such who can be reached through the "For Sale" columns of THE CLAY-WORKER.

Written for The Clay-Worker.

THE MODERN CLAYWORKER.—No. 13.

MANAGEMENT.

THE QUESTION OF water supply is quite vital to an irrigation proposition, yet no more so than is the question of a supply of good management for a clayworking establishment. This is a wordy subject, though good management, as experienced and cited, is expressed in few words—"By their fruits shall ye know them," and in no other way. This writing about good management is rather unsatisfactory. The man whom we are writing about has little time to tell us that we are right; the fellow we wish to reach is generally the sort who don't need telling, and we can't advise people to try to kill that sort off and follow our advice, because the supply of "good managers" is limited, and brickmakers of the modern sort must have some one to blame for their troubles.

Did you ever notice what an unsatisfactory occupation it is reading "How I Became Rich," by some Napoleon of finance or industry. Of course, the appearance of these articles in the magazines is of comparatively recent date, and we can not judge closely whether readers are profiting by these instructions or not. It is pleasant talking to successful men; they are full of confidence, and confidence is contagious and a nice thing to "take," but how seldom we ever hear a direct receipt for the result, of which they are all so proud. Students of clayworking problems are wondering where the "managers" are coming from. It is a question that has been bothering all successful industries and lies in the direction of education. The lack of management is apparent wherever one goes; that is, examples are found in every locality, and, unfortunately, these are not always by the side of examples of good management. Some few months ago the writer happened to hear a conversation between a "modern" clayworkers and a kiln man. Mr. M. C.-W. (which will indicate Mr. Modern Clayworker) was a clayworker of the banker type, a very nice gentleman, by the way, and owner of a very nice little plant, well equipped with kiln-room, but looking for more and of a sort that would answer his purpose. He was naturally anxious to get good hard burns, as his output was of face-brick variety and his local market was of the great small kind, requiring the best at lowest prices, and his shipping proposition was of the large competition and small demand order. The writer has examined his clay and finds that it is the kind that men of experience consider easy to burn. A rather refractory clay with a wide range between the settling and melting points.

His kilns were well constructed, with ample draft force, yet he had trouble in getting the bottom of his kilns burned at all, and trouble was his all the way through. Now, it has always seemed to me that what that plant needed most was a manager. It had had several rather too high-priced "superintendents" and burners galore, but some way the results were always about the same. Now, this brickmaker was not filled with confidence. He had been "gold-bricked" so much that the kiln-man had a job on his hands. He made a good talk, such as he would make to an experienced, practical brick man, but he wasn't in it at the start, and, I am forced to relate, left the field with banner trailing. The outcome of the whole thing was, the brickmaker admitted that he had no manager and knew nothing about what he should have and had to depend on what others had done. The kiln, being new (and without doubt very good), it was not possible for the kiln-man to exhibit examples of successful burning near at hand. The brickmaker was, at the time, about decided to follow the example of a neighbor and use a kiln that was working with fairly good success in a tender or rather a clay which would stand but little high heat and a very small range. No doubt trouble will follow the poor gentleman, unless good fortune should happen to put him in the way of a good manager or a kiln that might accomplish his work without much skilled attention. We can wish him success.

I afterwards had quite a conversation with the kiln-man, and he said he didn't feel half as bad as the other fellow would before long. He held forth to some length on this subject of managers, and remarked that he expected to do business with firms having managers, and wouldn't spend any money going to see the other sort unless he succeeded in getting a good line of recommendations to "spring" on the inexperienced.

This example impressed strongly upon me the advantage in even the smallest of "modern" brick plants having a good manager. Here would have been a good place for a man that could be had for perhaps $150.00 per month to make the plant pay good interest, and, as the market grew, to make the plant a good investment of the large-return order. No plant should be started unless the market is large enough to pay a manager. It is almost correct to say that no plant should be run that did not have a chance of running nine months at least. Perhaps we should say no "modern" plant. We can not handle the few remaining examples of hand and small local yards, run by comparatively well-experienced men, for that sort of plants, in these statements as to what is best or wrong. The definition of "modern" clayworking plants is of necessity very lengthy. In the accepted sense it is "up to date," but in reality it includes several classes, among them:

The large, complete, economical plant, either the outgrowth of small beginnings or the investment of large capital on the recommendation of experienced ceramic managers, owners or otherwise, built to produce good ware regularly and at a profit and to fill an evident demand. These are the successful sort.

Large, cumbersome, unwieldy, poorly arranged productions of inexperienced manager owners; the result of John Smith's, Henry Brown's and John Johnson's advice, or the productions of recommendations not made to fit. Under inexperienced management and the usual unsatisfactory attending superintendence, such plants continue to grow more unwieldy and keep investment perpetual, without return.

Other types of "modern clayworking establishments" are those for which plans come from the machinery houses, supplied to inexperienced owner management, but of natural ability in the line. Usually such plans are quite satisfactory if followed out. Such plants are often located in poor market and with small available capital, and the result is quite problematical. Then we have the well-installed and well-managed small plant, which, under favorable market conditions, will return a small percentage return. However it may be, small investment or large investment, good equipment and poor equipment, under poor management, they all sooner or later reach the bargain counter and have served no purpose except to disturb the market.

In talking with a heavy stockholder in a large clayworking plant recently, the writer enquired as to the duties of the manager, and was told that he "had to make the plant pay." That was to the point, and when asked what he did, the reply was, "He runs the business. I mean by that that he looks after the selling of product, buying of all materials both of general supplies and materials for improvements which have been sanctioned by the board of directors. In fact, he does all the business of the corporation, except, perhaps, anything of a special financial operation. I have left off worrying about the business. You know I have in the past sat up nights with my business when it didn't need it; have been referred to on everything, no matter what, but I have put that off on my manager now, and I must confess that it bothers him a whole lot less than it did me, and I am not complaining of results. In the first place, he don't worry at all. He is a man of system, uses it everywhere. I can quickly tell, by a glance at his records, just what is being done, and in a much more satisfactory manner than I used to be able to by close attention to all the details of the business for at least twelve hours a day. He is a man of *results.* Nothing else counts with him, and they are all that he bases his estimates on on the value of his heads of department. Since he came to me he has had two new foremen. I used to think my old foreman was a good man at the business, but I can easily see now where he fell short. Excuses used to go with him, when they seemed "good," but there is no good excuse for disaster on my plant now. I always considered it a disaster to have my plant non-productive. Foreman can't give excuses for their men, and so he can't accept them. I thought at first he was inclined to want to pay too high a price for his skilled help, but they are all anxious to keep their places, and so everybody is earning their pay on my yards just now. It was only necessary to make some minor changes in the plant, and, though the manager sees an endless amount of changes that he would recommend, he says he expects to make extra money enough to pay for them before he undertakes remodeling to any extent, and then he expects to cut down expenses so we can afford to pay him $5,000 a year. Well, he is worth more than that now, so I guess he will get it when the time comes. I used to have trouble in irregular burns. I don't find it so now. There is not only a regularity in burns, but a regularity in fuel consumption per thousand brick, and we can now tell what it is *going* to cost us to burn a thousand brick. Having a regular output, our steam charge is much less per thousand, and the change in the fixed expense charge, though larger, is less per thousand. Some way I have very little trouble nowadays, and I think the brick business is a good business."

"Does he give much time to new ideas? I should think he must, for a man can not do everything himself."

"He is a manager, and not an inventor.. We *have* paid out some money in royalty on patent ideas since the advent of our manager, but I guess the charge has a large credit, because there is no use in any one trying to sell us something that has no merit. When we can get good results from what we buy, we are always glad to buy. Yes, I guess the new thing has a pretty good chance on our yard, if it's good."

He was on Easy street for sure, and it is all on account of management.

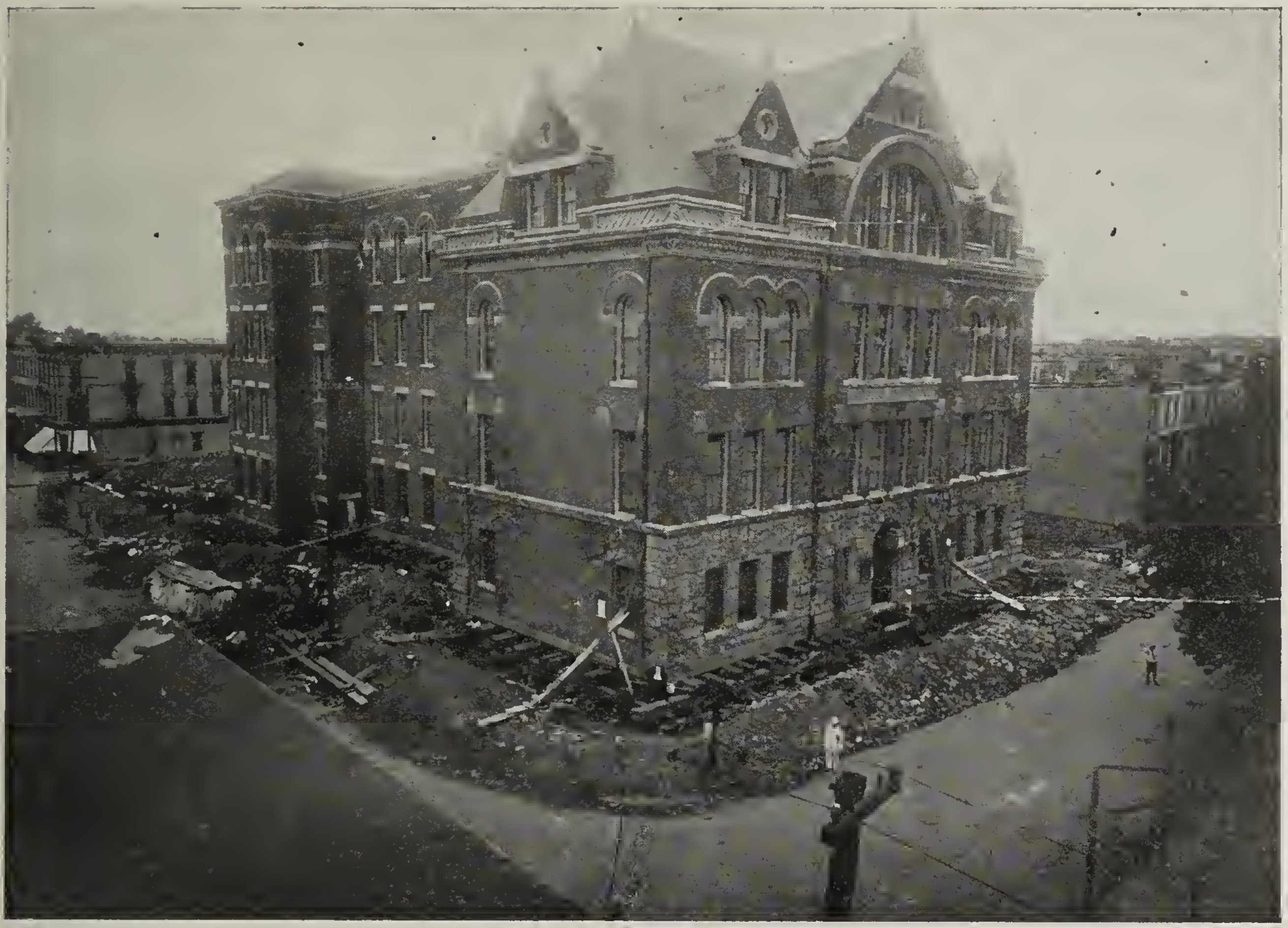
It's better to be placid than acid. The quickest way to get everybody sour on you is to be sour on everybody yourself. People turn to a cheerful man instinctively, as chickens flock to the south side of a barn on a day in winter.—*Ex.*

A RECORD HOUSE RAISING.

WHAT IS GENERALLY considered a remarkable feat of engineering was successfully carried through recently, namely, the raising of a large four-story brick school building. The reader will get an idea of the immensity of the undertaking from the accompanying photograph. The building, which measures 154x84 feet around the base line, was raised 34 inches, and a new foundation built under it.

The building is Public School No. 85, at Covert street and Evergreen avenue, Brooklyn, in what is known as the flooded district. Heavy rains flood the lower floor of the building to a depth at times of several feet. It is to remedy this and also bring the main floor of the school building up to the level of a new thirty-two class room addition that the Board of Education entered into a contract for raising the old structure. This alone will cost more than $25,000.

From an engineering viewpoint the raising of the building from its foundation to the height called for in the plans is a remarkable piece of work, and is considered far ahead of that some years ago, when the Brighton Beach Hotel was moved back several hundred feet to save it from being undermined by the heavy tide.



Brooklyn School Building Being Raised 34 Inches.

Miller, Daybill & Co., who had charge of the lifting of the school building completed the job without accident or injury to the superstructure and then turned the building over to George Hildenbrand, general contractor, who put a foundation under it.

The estimated weight of the building is 7,500 tons. It was raised by 1,000 jack-screws and hundreds of rows of heavy timber specially prepared for such use. The work was completed in four weeks.

The lifting was done by seventy-five men working simultaneously, each turn of the jack-screws only raising the building by the smallest fraction of an inch. After each turn the foundations of the building were thoroughly inspected.—Building Bulletin.

The machine which does not answer your purpose may be just what some one else needs. Tell the "needee' about it in a card in the "For Sale" columns of THE CLAY-WORKER.

Written for THE CLAY-WORKER.

FIRE CLAY INTERESTS OF KENTUCKY.

Prosperity and Activity Prevail in the Bluegrass Region.

A FEW YEARS BACK it was scarcely known that Kentucky possessed any fire clay, yet to-day she is furnishing the market with the best products in that line of any country in the world. Carter county, and what is now Beckham county, are conceded by all manufacturers to be the very best yet discovered. Eastern Kentucky was so backward in the way of modern facilities of all kinds, that until the fire clay interest brought it to the front, it was comparatively unknown in the great mercantile world. To-day more than a million dollars is invested in this once barren waste, and yet the industry has hardly begun. The Carter county fire clays, which are now so celebrated, and which are recognized as being among the most refractory fire clays ever developed in the world, were first manufactured into fire brick and put on the market by the Olive Hill Fire Brick Company, who, in 1895, built a small plant and began the manufacture of the Olive Hill fire brick. The company is composed mainly of citizens of Wheeling; W. Va., and Kansas City, Mo. The plant they are now running cost them over six hundred thousand dollars.

Previous to this, considerable clay had been shipped from the property they now own by Sebastan Eifort, and a mine has been operated for a number of years several miles east of Olive Hill by Mr. K. B. Grahn, proprietor of the Louisville Fire Brick Company, the clay being shipped from the mines to Louisville and made into brick there.

To properly understand the great value of the Olive Hill clay, it will be necessary to explain that fire clay is very common, as it is usually found in the same vicinity coal is discovered, but in all fire clay districts so far developed, excepting the Olive Hill, there has always been found a great preponderance of plastic clay and very little flint. The plastic clay usually fluxes or vitrifies at a comparatively low temperature, while the best flint clays cannot be vitrified at any temperature used in manufacturing, so the brick is more refractory in proportion to the greater amount of flint clay it contains, and is more easily vitrified than the greater percentage of No. 2, or plastic clay used.

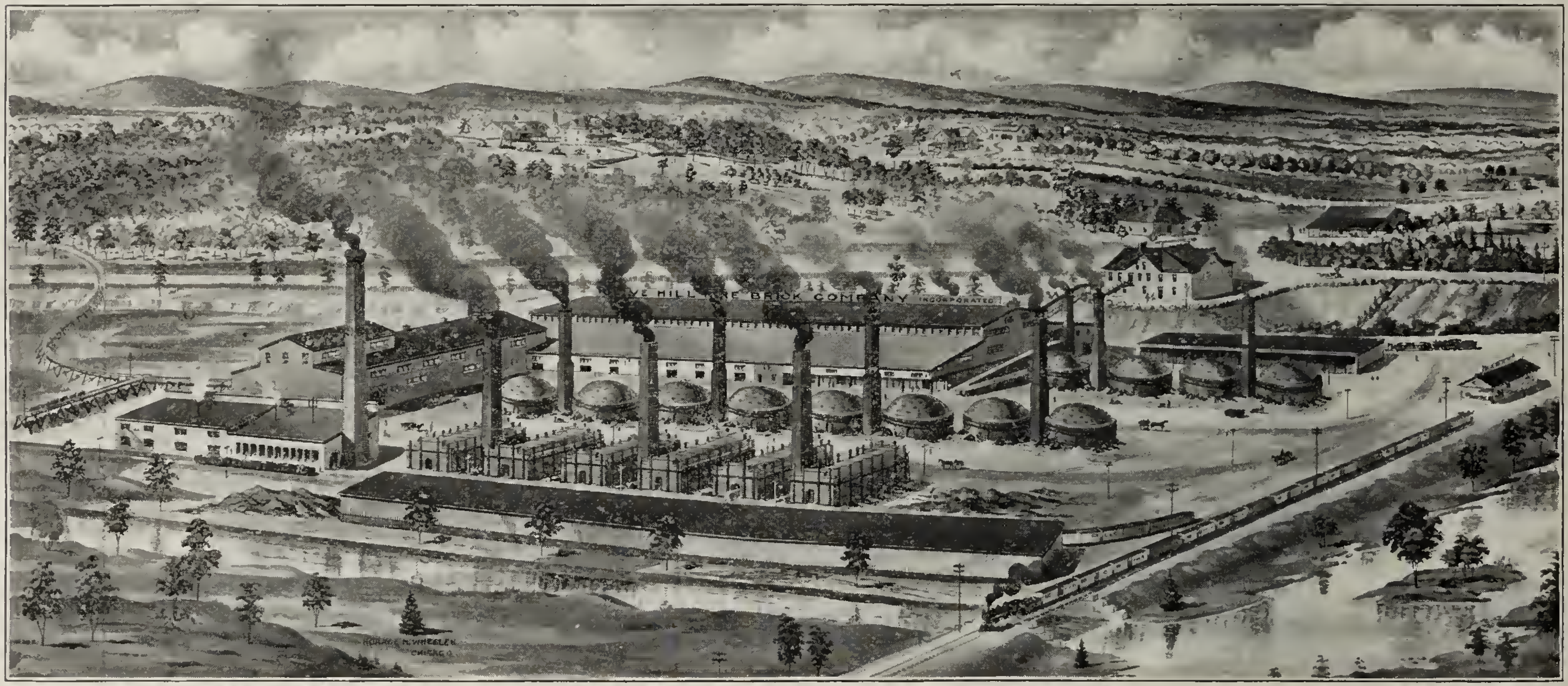
The No. 2, or plastic clay, is a necessary evil, and the less of it is used the more heat the brick will stand. The vein of clay now being mined by the Olive Hill Fire Brick Company, is all flint and runs in thickness up to twenty-five feet. What little of bonding clay they use must be hauled in from other points at a much greater expense than their flint clay, so the problem with them has been how little plastic clay they could do with, instead of how much they could put in, as is the case with most fire brick manufacturers.

Their brick have now been on the market about ten years, and some of the fire brick they made, which went into coke ovens, are still in use, doing good work. The brick have made particularly good records in blast furnaces, some furnaces lined with them having been in continuous blast for seven years, turning out up towards a million tons of pig-iron.

This company owns 1,900 acres of Olive Hill big vein flint fire clay, 200 acres of clay adjoining the Louisville Fire Brick Company, located six miles east of Olive Hill, and in which locality the clay is almost all No. 2, or plastic clay; also, 430 acres of fire clay and coal land on the line of the C. & O. and Eastern Kentucky railways, nineteen miles east of Olive Hill. The plant as originally constructed, consisted of 150-horse power Erie City engine, two boilers, one Stevenson 9-foot dry-pan, one Stevenson 8-foot wet pan, one steam dryer of two tunnels, or four-track and five 26-foot round down-draft kilns.

In the past three years the plant has been entirely reconstructed, and now has the original two boilers, with another of the same kind to be installed, one 500-horse power Buckeye automatic engine, 400-light electric lighting plant, one Schoellhorn-Albrecht hinged hammer crusher, capacity 1,000 tons per day, one crusher of the same make, capacity 50 tons per day, one Dunlap Perfection screen of the largest size, one Stevenson 9-foot wet pan, one Stevenson 8-foot wet pan, two American Clay Working Machinery Company's 8-foot wet pans, one Portsmouth 7-foot wet pan, an eight-tunnel, sixteen track waste heat dryer, operated by supply and exhaust fans, five 26-foot and four 28-foot round down-draft kilns, and six oblong down-draft kilns now under course of construction, two of which are completed. They have over fifty thousand square feet of floor room, most of which is hot floor. The brick are all made by hand and are made in daylight. The present capacity is 40,000 per day, which will be increased as soon as more kilns are completed.

Notwithstanding the fact that the fire brick business is at present very dull and most of the fire brick plants all over the country are running on slack time, this company is as busy as it can be and is running behind with its orders, their business for the month of September being the largest in their his-


VE HILL FIRE BRICK COMPANY INCORPORATED
HORACE M. WHEELER
CHICAGO

Works of the Olive Hill Fire Brick Company, Olive Hill, Ky.

tory, their shipments amounting to one and one-half millions.

This immense plant has been described only as a sample of what this country is producing. The Louisville Fire Brick Company's plant is six miles east of Olive Hill, and is doing a thriving business.

The Portsmouth Harbison-Walker Company has also a large plant near Olive Hill, and one at Fire Brick, Lewis county, in addition to several on the Ohio side, just opposite.

A plant at Soldiers, Carter county, and one at Salt Lick, in Bath county, are doing well, and still there is room for more, for it is the opinion of experts that the supply of fire clay is simply inexhaustible all through eastern Kentucky. D. E. W.

Written for The Clay-Worker.

NORTHERN OHIO BRICK AND BUILDING NEWS.

ONLY FIVE of the eleven brick plants in Toledo are running. Before the end of another month, it is very probable that all will have been closed down but two—the Findlay Hydraulic Press Brick Company and the Ohio Hydraulic Press Brick Company's plants, which are so equipped as to enable them to run through the entire winter. Business is light, and as the yards were filled to their full capacity, six plants had to close down.

Some of the brick men are inclined to think that the prevailing weakness in the brick situation this season had its origin in the presidential campaign year. Others blame the concrete and cement block business as affecting the brick business, while others put the blame on the high prices of building material which have prevailed throughout the season.

W. O. Dakin, secretary of the Toledo Brick Supply Company, had the following to say on the situation: "The brick business has been greatly affected by the advent of concrete material and cement building blocks. Had these not been substituted for brick, the business for the season would have been a little above the average. The yards have been filling up, business has been comparatively light, and even now there is no business to speak of."

"As near as I can judge, from 20 to 25 per cent. of the brick business in this section has been taken away this season by the concrete and cement block people," said W. A. Howell, secretary of the Collingwood Brick Company. "Business is light and the yards are full, with the plant closed down."

Frank Gorman, superintendent of the Kohler Brick Company, said: "We have room for a million brick yet. Business has been good throughout the season."

"We haye some room in our yards and will keep running until the frost comes," said L. Burkhart. "I look for good business next spring. Trade this year was affected by high prices, labor conditions and the election year."

"Business has been quite good this season," said Warren Boice, of the Northern Brick Company. "We closed down our plant the first of the month."

"I attribute the light season to the presidential election," said Richard W. Clark, of Spear & Clark. "The total output from Toledo brick plants has been curtailed about 20 per cent. on account of this influence, and the advent of concrete and cement blocks on this market. I believe there will be a good season for the brick men generally next season."

"This has been an off year in the brick business," said Frank E. Tracy. "I have stopped making brick for the season; however, I have some burning to do yet. I think the cement business has been against us. I don't see why this is so, as bricklayers tell me that concrete or cement blocks as used in the erection of many buildings in Toledo are not of the durability of brick. One large building showed this weakness and has already cost the contractors $1,600. The new materials cost more, too. The cost of making brick was considerable more this season than in former seasons, and this made the brick business less profitable this year."

While the brick men have been justified in complaining about the rather dull season, there has been quite a good deal of building activity. The Clay-Worker man called at the office of the city building inspector, and from Burton C. Ames, second assistant building inspector, it was learned that there had been good building activity for the past three months. Through the courtesy of Inspector Ames, The Clay-Worker was given a report of the business done during the season from early spring to the present time: March, permits were taken out to the amount of $103,113; April, $201,203; May, $281,763; June, $121,965; July, $288,320; August, $300,000; September, $288,320. It will be seen the business during the last three months was about equal. For the month of October, the amount of the permits taken out thus far, if the same activity keeps up, will not fall but a little below that of the last three months.

There was a slight decline in the prices of lumber recently, and this has helped the building situation considerably. Nearly all the carpenters in the city have been busy, but from this source and especially from the architects generally, a slump in the building activity is indicated from now on. The permits taken out at the city building inspector's office indicate many repair jobs, more permits, but the amount for each permit will average much less than the permits taken out during the previous three months.

The permit, involving the largest expenditure of money, was taken out by the Sisters of Charity, during September, for a brick hospital of three stories to be erected on Cherry street. The contract has been awarded to William Miller at $52,000.

The Henry J. Spieker Company has been awarded the contract for the erection of section A of the Collingwood avenue convent. This will be known as the auditorium building and will be 100 feet square and 90 high. The structure will be in Flemish style and will be but one story. The contracts for three sections, A, B, and C, have now been let, there yet remaining nine buildings for which contracts are to be let. Spieker's contract calls for $23,334, which only calls for the enclosing of the building. The construction of all twelve buildings mean an outlay of between $500,000 and $600,000.

An additional school building will be erected by St. Peter's church. Brick will be used, the building to be two stories high, 60x40 feet. F. J. Herman has the contract at $10,000.

A permit has been taken out by Otto H. Hohly for a brick residence to cost $3,300, at Robinwood and Delaware avenues.

A permit was also issued to Nicholas Gemhardt for the erection of a brick and cement store and flat building at the corner of Central and Detroit avenues, cost $4,000, size, two stories 60x40.

The Toledo Metal Wheel Company will erect a four-story addition to their plant on Bancroft street. The building will be 60x50 feet in size and will be constructed of brick and steel.

The Northern Brick Company is contemplating the enlargement of their East Side plant. It is planned to double the capacity and have the improvements completed for spring business.

The Toledo Board of Education, at a recent meeting discussed the project of the erection of additions to a number of school buildings. It is very probable that $100,000 will be expended in this direction during the next season.

O. S. Cheney has decided to erect a four-story flat building to cost about $25,000, at the corner of Adams and Twenty-first streets.

Only three paving contracts were let during the past four weeks. Russell & Jennisen were awarded the contract for the paving of Collingwood and Delaware avenues from Manhattan road to Ottawa river for $12,708.10, Metropolitan blocks or concrete to be used.

The paving of Oneida street has been let to J. C. Carland, Canton block to be used.

O'Sullivan & Shehan have been awarded the contract for the paving of Virginia street form Lawrence to Detroit avenue. Logan block on crushed stone foundation will be used.

The City Council of Fremont, Ohio, has decided to construct a new sewer system in the east section of the city. The cost is placed at $25,000. T. O. D.

OFFICIAL ANNOUNCEMENT.

The Nineteenth Annual Convention of the National Brick Manufacturers' Association, to be held at Birmingham, Ala., January 30th to February 11th, 1905.

THE EARNEST "call" from the Southland has been heard and heeded, and while due consideration has been given the claims of other cities, from which similar invitations were received, the home of Treasurer Sibley is easily the first choice for our 1905 convention. We have been influenced not a little in this decision by the accessibility of Birmingham. Located on the great Trunk lines of the South, it can be reached by fast through trains from almost every section of the country, and while situated far enough south to insure mild weather, and out-door pleasures, it is not so far south as to be difficult to reach, even for those whose time is limited.

Birmingham is but a night's ride from Cincinnati, and so may be easily and quickly reached by the large number of our members residing in the Central States. It may also be reached with almost equal facility by our eastern members, who can make direct connections via Washington. While the western members will have the advantage of through trains direct from the principal cities of Texas and the States lying north of the latter and west of the Mississippi river.

The get-at-able-ness of Birmingham will appeal to all of those who feel that they can spare but a few days from home at that season, and to those who can arrange for an absence of a couple of weeks or more, it will appeal irresistibly, for a series of most delightful side trips to points further south, such as New Orleans, Mobile, Tampa, Jacksonville, and other Florida points, may be planned. Those going via Cincinnati will be afforded an opportunity of stopping off at Chattanooga, where they can visit Lookout Mountain and the famous battlefields of that section, which are now reached by trolley car from Chattanooga.

Birmingham is a beautiful and thoroughly up-to-date southern city, and with her suburbs now has a population of over 100,000 people, and affords unexcelled facilities for a successful convention, including a splendid modern hotel, the Hillman House, which will be headquarters during the convention, and an ample convention hall and exhibition room for the display of brickmaking machinery, etc.

There are all kinds of brickmaking plants in the vicinity of Birmingham, all of which, it is anticipated, will be in operation, thus affording delegates an opportunity of fully investigating the *modus operandi* of the various factories, which include up-to-date soft clay, stiff clay, dry press and sand-lime processes; also a large sewer pipe plant and extensive chemical and metallurgical establishments, the doors of which will be thrown open to our members.

In due time further particulars as to railroad rates, the proposed side trips, etc., will be announced. Those desiring further information relative to the requisite of membership, etc., are requested to communicate with the secretary at Indianapolis.

THE EXECUTIVE COMMITTEE,
W. S. Purrington, *President.*
Theodore A. Randall, *Secretary.*

MID-YEAR MEETING Of Clayworkers at the World's Fair.

A Large Attendance and a Delightful Week of Sight-Seeing and Social Intercourse.

NO DOUBT every visitor to the Louisiana Purchase Exposition will carry for many years, recollections distinctive to him or herself, or the State or association to which said visitor belonged, but it does seem to us that the crowning kingday triumph of the great World's Fair was Brickmakers' Day, October 5th, which the authorities had assigned to the N. B. M. A.

We were there in force the beginning of the week, whether members or non-members so that he or she if a clayworker, was equally welcomed by the forceful, energetic Secretary, Brother Randall, Miss Wallace, the assistant secretary, and the members of the reception committee, though as one of the members of said committee, I must admit that, as usual, the Secretary did nearly all the work.

Many were the cordial greetings of friends and brothers who had not met for years, and many were the friendships initiated that may endure in the years to come. On the evening of the 5th, Missouri offered her hospitality to the visiting clay men in the magnificent State building, where a "smoker" was given by St. Louis brickmakers and clayworkers. The committee that had charge of this consisted of Mr. Lemon Parker (Parker-Russell Company), chairman; Anthony Ittner (Anthony Ittner Brick Company), M. F. Williams (Williams Crusher and Pulverizer Company), J. M. Williams, Gordon C. McNeil (McNeil Brick Company), Fred. Talbot (Laclede Fire Brick Company), Eb. Rogers (Fernholtz Brick Machine Company), Prof. H. A. Wheeler, John P. Camp (Ross-Keller Dry Press), W. P. Grath (Grath Patent Brick Kiln), S. Geijsbeek, R. F. Grady, Robert Twells, George J. M. Ashby.

The smoker had a distinctive feature, for on a small table near the door was piled a number of "Missouri meerschaums" and a sack of highest grade tobacco. Each visitor took a "meerschaum," if not to smoke to keep as a souvenir, but there were excellent cigars, too, in plenty, which Prof. Wheeler hospitably pressed upon everyone. The thirst quencher was distributed in "steins," so that a song in the course of the evening from the comic opera, "The Lady Slavey," rendered by a fine quartet, was most appropriate, in which the chorus runs:

"For it's always fair weather
When good fellows meet together
With a stein on the table
And a good song ringing clear."

Lemon Parker as chairman of the local committee called the meeting to order, and, in a few well-chosen words, thanked the visitors for their presence. He then introduced Mr. William Ittner, architect to the St. Louis School Board, as master of ceremonies of the evening, but Brother Randall had evidently been getting in his fine work. He had brought with him two spectacular visitors who attracted all the attention of the gathering; two natives of Cathay, arrayed in—

"Robes of royal state that far
Outshone the wealth of Ormus and of Ind."

They were the Hon. Moy Kee and his friend, native of Canton, China, and their gorgeous dress, that would outshine the uniform of a Governor's staff, betokens some high rank in their native land. The Hon. Moy Kee has resided in the Hoosier capital for some time, and was introduced by Brother Randall as a distinguished fellow townsman. I don't quite remember how Brother Moy worked himself in as a clayworker, but he did it quite ingeniously, somehow, and addressed the meeting in excellent English, without saying "Melican" for "American."

Master of Ceremonies Ittner gave a felicitously expressed address and then read a letter from President Francis, expressing regret at his inability to be present, and then introduced Dr. J. A.

Holmes, chief of the Palace of Mines and Metallurgy, though it would be better to say Chief of the Department, for his domain is far more extensive and reaches out through all the Mining Gulch, but Dr. Holmes' domain goes much further even than that; it extends through the hearts of all who come in contact with him, for we all love him. There is nothing stiff about Holmes.

He gave the clayworkers a cordial welcome, told of the efforts and success in making this first representative exhibit of the great clay industries at any international exposition. His address was that of a scientific man, of a man accustomed to wide and weighty responsibilities. How well he can handle these is proved by the fact that there has been no friction at any time in his department. Dr. Holmes' address was not a lengthy one, it might well have been longer, but we felt all the better for it.

Will P. Blair, of Terre Haute, Ind., second vice-president of the National Brick Manufacturers' Association, responded on behalf of the Association, and showed that he can make as good a speech as he can a paving brick.

Secretary Randall read the following letters of invitation for the Hydraulic Press Brick Company, extending the freedom of their plants to visitors and requesting the privilege of entertaining the members of the National Association and their friends the following night on the Pike.

Office of
THE HYDRAULIC-PRESS BRICK COMPANY.

Mr. T. A. Randall, Secretary N. B. M. A.:

DEAR SIR—If any of the members of Brickmakers' Association wish to visit our works on King's Highway and Frisco R.R. they will receive a cordial welcome by those in charge. The badge of the Association is sufficient introduction.

The officers of the Hydraulic-Press Brick Company will be pleased to receive at any time the members and their friends at the main office of the Company, Room 1212 Missouri Trust Building, Seventh and Olive Streets, where every facility for business or correspondence will be extended to them.

THE INVITATION TO THE PIKE PARTY.

The Hydraulic-Press Brick Company extends a cordial invitation to the members of your body to visit the "Pike," on Thursday evening, October 6, 1904, as the guests of the Company. Mr. C. M. Fitzhugh will represent us to make the occasion a pleasant one and to act as chaperon to see that no one falls by the way.

Yours truly, H. W. ELIOT.
First Vice-Pres. Hydraulic-Press Brick Co.
St. Louis, Oct. 5, 1904.

These communications were greeted with hearty applause, and there then followed in quick succession short addresses by Gordon McNeil, St. Louis; G. W. McNeis, Kittanning, Pa.; Treasurer John W. Sibley, Birmingham, Ala., and Col. I. S. Gordon, Indianapolis, Ind., who is a pleasing and convincing speaker. Mr. Ravold, of St. Louis, gave a comic recital in fine style, and the evening, which had been interspersed with musical numbers, concluded by the quartet singing "Auld Lang Syne," in which all present heartily joined.

George F. Baker. C. M. Fitzhugh.
Representatives of the Hydraulic-Press Brick Company.

FROLIC ON THE PIKE.

Nearly two hundred and fifty guests, about one hundred of them ladies, did the Hydraulic Press Brick Company entertainment on the Pike. About 8 o'clock we had gathered at the Kansas City Cosino, near the model city, and in front of which there is a fine sample of street paving laid with hydraulic vitrified paving block. From here we moved upon "Mysterious Asia." The stately form of the handsome Fitzhugh, with his thick crop of snow-white hair, and his sedate though kindly associate, G. F. Baker, led the procession. Prof. Wheeler and Secretary Randall brought up the rear, armed with Jericho trumpets to which great yellow streamers were attached bearing the word "Pikers." Together they did the work of rounding up the laughing, giggling, chuckling, cheering, jubilating crowd. The noise that Wheeler made with his trumpet reminded us of the fact which the Japs have impressed upon the world, that results are not always in proportion to inches.

Mysterious Asia had certainly never been done more thoroughly. The Hydraulic people had bought it—stock, lock and barrel—for the night and presented it to their guests. The camels were theirs, too, and Fitzhugh and Mrs. Snider, of Dallas, Texas, (Texans are all-right good fellows), went on the most lurching, rolling camel out on the Pike, while Randall's winning way prevailed upon an Asiatic lady to desert her booth and accompany him on a camel ride, too. He didn't notice that while he was talking and smiling so seductively to that Asiatic beauty Mrs. Randall was standing close behind, taking in the situation and liking it. Nothing was allowed to interfere with the hilarity of the occasion.

Miss Wallace, the assistant secretary, and young McDermott graced another camel, and rare high jinks they had. It is enough to say that young McDermott worthily emulates the "old man." Can any one imagine things being slow or dull when Chris McDermott is there? It seems strange, too, that he could ever be called the old McDermott. Such is the penalty of having bright sons. Chris himself also rode a camel with Miss Durler, of the Clay-Worker staff. The couple made a fine example of amplitude and tenuity. Our graceless secretary said "the fat and the lean."

After the mysteries of "Mysterious Asia" had been turned inside out, hind-part fore, and upside down, the whole party, keeping in pretty good line and shape, went to "Fair Japan," but here we soon became so much at home that we split up into little groups, distributed about at the tea tables, "chinning" with the smiling little geisha girls, sipping tea and swapping jokes, till Wheeler's horn signaled "move on."

From "Fair Japan" the next etappe was "Paris." Think of it, "Paris" on the Pike. By this time there was no semblance of keeping in step or line, and all of Randall's rounding up and Wheeler's vigorous trumpeting were of no avail, but we got there, all the same, and if the unfortunate "announcer" at "Paris" didn't have a good time, we did. We got more fun out of that announcer every time he told us what the next piece would be, than a whole carload of pieces that would make a cow laugh. Baker and Fitzhugh, who were doing the honors for the Hydraulic, were prepared to offer us several more shows, but there is a limit, even for the sturdy clayworker, and "Paris" provided it. 'Paris," assisted by ourselves, for anyone going in another time would perhaps not find it quite so hilarious. Those of us who participated will certainly never forget our night on the Pike.

The Enjoyable Kentucky Reception.

The evening of October 7th, the Kentucky commissioner, Mr. William F. Keates, who is in charge of the clay exhibit of Kentucky at the World's Fair, invited us to the beautiful building that Kentucky erected and which was the first of all the State buildings to be completed. There were about one hundred and fifty of us guests of the Kentucky Commission, and in the receiving line were the hostess of the Kentucky building, Mrs. Bertha Miller Smith, Mr. R. E. Hughes, secretary of the Kentucky Commission, and Mr. Keates.

Wm. F. Keates, Owensboro, Ky.

There were some addresses and responses of welcome and kindly greeting, but as in most of our gatherings, the fraternization was the best part of all. There was many a cheery word and smile and joke, a little dancing and some music and song. But one cruel, practical joke was played by the editor of The Clay-Worker upon this unfortunate scribe. I had undertaken the honorable task of describing, as well as I was able, for the benefit of the unfortunates who could not be with us, the joyous times we had, when he sprang upon me the order to describe the ladies' dresses, too. There was no reason for it. Miss Wallace could have done it in the proper society reporter style, or Miss Durler; but no, I had undertaken the job, and I must complete it. I have had my revenge, though. I have gotten even with him, for I passed the order on to my foreman, who was also there, with strict injunctions that he was to do it himself, right away, and not get any one to help him, either, and this is what he has given us:

JIM'S REPORT.

I dunno exactly how I ought to start this job. Perhaps I ought to go according to the alphabet, but that ain't easy. Besides, the first lady there seemed to me Mrs. Randall, because I knew her—saw her years ago at Cleveland—knew her at oncet. She didn't look to have changed any. Well, she was dressed mostly in black, as black as our new iron smokestack, except the upper story, which was black specked with fire clay. She wore a black roofing tile.

Mrs. M. F. Williams: She was all right, also black, with roses and some perforation business. A crusher and pulverizer effect.

Mrs. Bertha Miller Smith, the hostess: Say, she's a Kentucky girl, you bet! She comes from the State where they have beautiful women and fine horses. I guess the second proposition is all right, and Mrs. Smith proved the first one. (That is all very fine and true, Jim, but you are dodging the question of dress.)

Mrs. Lemon Parker: This ain't so easy. The dress was white, any way, white glaze with egg-shell finish and pink trims, a pink platting and some more pink gave a sort of pale peachblow effect. The lady looked a peach, too.

Mrs. Phillips, of Pittsburg: More black enamel, but with turquoise blue trims.

Miss Phillips: This was a pale blue enamel from top to bottom, with cobalt specks.

Mrs. Ashby: Dark red brick with a lot of black vitrified trims.

Miss Jones: Fine stand of speckled A No. 1 white platting and pink roses growing over it.

Miss Murdock, Memphis: A combination fire flashed brown, with top platting of white enamel.

Mrs. Scott: This is another one that ain't easy. The dress and hat was light blue—could not have been enamel, was too fluffy looking, was more like Gates' new crystal effect on his Teco ware.

Mrs. Anthony Ittner: Black with dull finish and white enamel trims.

Miss Anne Ittner: Dark blue, with soft matte glaze.

Mrs. Warren Ittner: White glaze effect, with apple green platting with pink posies.

Mrs. Harry, Dallas, Texas: This was more black enamel.

Mrs. Talbot: This was black, too, with black enamel trims and black platting.

Miss Arnold: This had an indescribable fire flashed effect in brown, buff platting with brown over glaze.

Miss Durler: This was another fine stand of A No. 1 pale buff, a Milwaukee cream. The platting was the biggest on the yard.

The above is all that is available, for though there are a number of other names scattered among a jumble of illegible notes, Jim declares that an accident happened to them and that a glass of that seductice Roman punch which Mr. Keates was urging all to partake of was spilled among the papers. It is evident that there was a glass too much somewhere. A. Saint.

WORLD'S FAIR DISPLAYS AND INCIDENTS.

Those who attended the midyear meeting of clayworkers at the World's Fair found a multitude of things of special interest to them in the Clay Industries Section. How the delegates gathered in groups, first at one exhibit and then another, is well illustrated in the central picture of the group on page 344 where our camera caught a round dozen of good fellows at one shot, the party including Miss A. Murdock, and Frank H. Reid Memphis, Tenn.; W. F. (Dixie) Scott, Keokuk, Iowa; Emile Fernholtz, just back from Germany; John Moroney, Chicago; G. C. Stoll, Wheaton, Ill.; F. A. Tecktonius, Jr., Racine, Wis.; William Bechtel, Waterloo, Ontario; J. C. Steele, Statesville, N. C.; J W. Turner, Lincoln, Neb.; Walter P. Grath, and J. A. McAnulty, of St. Louis. The exhibit at which they were "caught" is that of the Mound City Roofing Tile Company, and that it is attractive, the picture itself is sufficient evidence. It consists of a miniature cottage, constructed almost wholly of red tile.

Another exhibit of much interest to brickmakers is that of the Mitchell Clay Manufacturing Company, the principal feature of which is a section of a round down-draft kiln, in which is shown the manner of using their fire brick for bottoms, bag walls, etc. A fine assortment of fire brick is also displayed.

Another and very interesting collection of fire brick is pictured on the preceding page (343). The brick are from the kilns of the Parker-Russell Manufacturing Company. All manner of shapes are shown. Also, a couple of immense gas retorts.

The display of sewer pipe by Evans & Howard attracted much attention. It includes various sizes of high-grade sewer pipe up to and including 36-inch double strength culvert pipe.

The middle picture of this group is that of the Ross-Keller Brick Press exhibit. Here is shown a small model of that noted press, which has atracted a great deal of attention. The display is in charge of Mr. Aaron Woodhull, a gentleman of the old school who, by his kindly manner, has impressed every visitor who has stopped to examine and ask about the press, and the excellent samples of pressed brick which are a part of the exhibit, that it afforded him pleasure to give the desired information.

The display of Teco and other ware shown on page 345 challenged the admiration of every visitor, and had Gates been present and heard the comments he would have gathered material for a great variety of buttonhole talks.

The midyear meeting was certainly a gress success, and the National Brick Manufacturers' Association space was very popular throughout the week. If the easy chairs, which the faithful secretary so thoughtfully provided, but had ears, many and interesting would be the tales of trade lore, interchange of confidences, and jovial stories they could tell. When the week was spent, and the good byes were said, few indeed were there who did not have a deep down-in-the-heart feeling of regret that such gatherings cannot occur oftener.

SAND-LIME BRICK INDUSTRY.

A WONDERFUL industry which was to revolutionize the manufacture of brick in this country has been frequently described in the newspapers and trade journals. The claim has been made that brick suitable for all purposes could be made from sand with a small addition of lime, at a cost far less than that of ordinary brick. Time has not yet proved the truth of this statement; nevertheless, according to a paper written by Mr. S. V. Peppel and included in the annual report on "The Clay-working Industries," recently published by the United States Geological Survey, the sand-lime brick industry seems to have established itself and to have a promising future in certain sections of the United States. Where clay of good quality is not available but comparatively pure sand is abundant, the manufacturers of sand-lime brick may reasonably hope for success. There are many such localities in Michigan, Wisconsin, and other Northwestern States, also in the South and Southwest.

There are in this country at present about fifty plants, with a total capacity of approximately 1,000,000 bricks a day. The experience of these plants indicates that sand-lime brick can usually be manufactured a a cost below that of common clay brick. When, however, a sand-lime brick is desired equal to the fine clay front brick, the cost of production is naturally increased beyond that of common clay brick. Sand-lime bricks have been in use long enough, both in this country and in foreign countries, to prove that when properly made they have sufficient strength and sufficient water and weather resisting qualities to make them a safe building material.

The sand-lime brick of to-day is the natural outcome of the improvements made in the old mortar brick, which has been known for years. This mortar brick was at first never more than a molded mixture of lime and sand mortar which was allowed to harden in the air. About twenty-five or thirty years ago one Dr. Michaelis patented a process for the hardening of mixtures of lime and sand by steam under pressure, which is the fundamental principle on which the manufacture of sand-lime brick is based.

The commercial development of the industry dates back only fifteen years in foreign countries and not more than four years in the United States. In 1896 Germany had only five factories where sand-lime brick was made, but now it has about 200, with an actual annual output of between three hundred and fifty and four hundred million. Early in 1901 a plant was built in Michigan City, Ind. In 1902 about twenty plants were in existence and six million bricks were actually sold. Full and accurate data are not obtainable as to the actual output in 1903, but about twenty million bricks have been reported as sold in that year. Many of the factories had just started and were not manufacturing to their full capacity during the year.

Mr. Peppel's report contains a great many interesting details about the sand-lime brick, its history, and its manufacture. He discusses its properties, such as porosity, crushing strength, resistance to weather and to fire, and its color. He describes its composition and dwells on the conditions essential to success in its manufacture. These include, first, suitable raw materials—a comparatively pure sand, with the preference in favor of a quartz sand, and a comparatively pure lime of either type, with the preference in favor of a high calcium lime—and secondly, adequate machinery, which should consist of power and transmission, lime-preparing machinery, mixing apparatus, presses, hardening cylinders, conveyors, tracks and trucks. A well-equipped sand-lime brick plant, with a capacity of from 16,000 to 20,000 bricks in ten or twelve hours, will cost, independent of site, from $20,000 to $25,000.

Mr. Peppel closes his report with a list of the places in the United States and Canada where companies have been incorporated for the manufacture of sand-lime brick. Persons desirous of perusing Mr. Peppel's report may procure a copy by writing to the Director of the United States Geological Survey, at Washington, D. C., for the pamphlet entitled "Statistics of the Claywork-ing Industries in the United States, in 1903," with which it is published. Both reports will also be included in the forthcoming volume, "Mineral Resources, 1903," which the Survey has now in press.

Death of Augustus Campbell, Metuchen, N. J.

It is with much regret that we make the announcement of the death of one of our old citizens and a man who has been identified with the clay-shipping industries of Middlesex county for many years. Mr. Augustus Campbell died at his residence in this Borough, Monday evening, the 10th inst., aged 73 years lacking two days. Mr. Campbell leaves a family of five sons and one daughter, all grown, and also two brothers, residents of Metuchen, and a host of friends to mourn their loss. After an illness of practically one week the grim reaper closed forever the career of a good citizen and business man.

Mr. Campbell was the president of the Raritan Ridge Clay Company, which has been looked after by his son, William Campbell, for years, as far as the mining and shipping was concerned. It is perhaps nine years since the writer first made the acquaintance of Mr. Campbell, and we always found him full of information regarding clay matters in this section. One of the sons is a graduate of Prof. Orton's School, Columbus, Ohio, and now is connected with the Tottenville, Staten Island, Terra Cotta Works.

W. R. O.

Philip Schwartz, Columbus, Ohio.

Philip Schwartz, a pioneer tile manufacturer of Ohio, died at his home in Columbus, Ohio, September 16, at the advanced age of eighty one years. Mr. Schwartz first began the manufacture of tile in 1872, and he was the first president of the Ohio Brick, Tile and Drainage Association.

Written for The Clay-Worker.

CHICAGO BRICK AND BUILDING SITUATION.

BUILDING ACTIVITY continues to maintain a high standard in Chicago, having gone forward considerably over last month, when a slight falling off was noted. In the down-town district so many buildings are in process of construction that it was found impossible to grant permission for the "grand parade" with which the Barnum & Bailey circus generally announces its advent to municipalities, the streets being in a state of semi-blockade. At the southeast corner of Monroe and Clark streets the Rector business block is going up rapidly. Across Clark street and a door or two from the corner, a smaller building is being torn down to make room for a better one. At Monroe and Dearborn streets the First National Bank building is being completed, likewise the Otis block at State and Adams, and another block at State and Madison. Even in Michigan avenue, work on the new home of the Chicago Orchastra Association blocks part of the street, while in the outer sections of the business district mercantile blocks and small factory structures are rising in great numbers. In addition there is more than the usual amount of lighter building being done in the more suburban parts of the city, in the way of homes, apartment buildings and small structures for stores and shops.

From now on there would naturally be a slight falling off, gradually increasing as the open season favorable to building operations draws to a close. There is every indication, however, that next spring will see an activity in building lines here which bids fair to break all previous records. The most gigantic of the projects being considered, is that of the widow of the late Charles Netcher, for many years proprietor of the Boston store. In carrying out the plans of her husband Mrs. Netcher ultimately expects to put up a series of stores fronting on State, Madison and Dearborn streets, at an estimated cost of $2,500,000. This tremendous task, however, will not be undertaken all at once. The structures, each of which will be fourteen stories high, with foundations sufficiently strong to carry four additional stories, will be erected one at a time. Stores in Eastern cities are being studied by representatives of the architects and of Mrs. Netcher, and the final plans will be drawn in accordance with their report when they return. A large office block, the Champlain building, will have to be wrecked in carrying out this plan.

Still another State-street building will be that to be erected by Maurice L. Rothschild, at the southeast corner of Jackson boulevard. It will be twelve stories in height. Plans are being considered for the Majestic Theater building, to be erected in Monroe street between State and Dearborn streets, at a cost of $1,000,000. Stumer, Rosenthal, Eckstein & Noyes will put up another State-street skyscraper at 138-144, between Madison and Monroe streets. Plans for the Weber Theater, in Plymouth court south of Jackson boulevard, have been prepared by Architect Benjamin Marshall. It will cost about $200,000, and is to be completed within a year.

Local dealers report favorably on the activity in their lines. Charles Bonner & Co. hold pressed brick contracts for the city pumping station at Fullerton avenue, a large cold storage warehouse at Canal and Kinzie streets, and a new Roman Catholic hospital in Englewood, among their larger pieces of work, all these jobs requiring between 100,000 and 250,000 brick each. Bonner & Co, who have control of the Chicago agency for the Akron vitrified roofing tile, have secured enough orders from the South Park Board to keep one of the Akron factories busy for eight months, it is reported.

Mr. Bonner has been seriously ill for a number of weeks, necessitating continuous absence from the office. Complication of troubles, involving pleurisy, affected him, but he is reported to be getting better slowly. Meantime the brunt of the work falls on Mr. Marshall, who got up from a sick-bed himself only a few months ago.

Directors of the Illinois Brick Company have declared a 2 per cent. dividend, payable October 15. The books closed October 5. The declaration covers no particular period, being a simple 2 per cent. distribution. On July 15 there was paid another 2 per cent. dividend, making 4 per cent. distributed among shareholders this year. The stock, however, is 6 per cent. cumulative, and only 3 per cent. was paid in 1903.

Scrip.

A GOOD SEASON FOR MAINE BRICK MANUFACTURERS.

All conditions considered, this has been a good year for the brick manufacturers of what is known as the Penobscot district. It has been much better than was expected in the early part of the season much to the satisfaction of the owners of yards. The continued rain of the early spring retarded the commencement of work in all the yards and it was expected that, in consequence, the output of the different places would be considerably curtailed. Instead the total number of brick made in this city, Brewer, Orland and Penobscot, the places usually figured into this territory, will reach the total of 9,200,000, which is up to the average of past year, for, of course, the brick business is not what it was a dozen or twenty years ago.

Of this number the greater part will be made at the three yards in Brewer, the two yards of Orland will be second, the two of Penobscot will come next, and Bangor's one yard will have fourth place. The amount which will be manufactured in each place will be:

Brewer	3,800,000
Orland	2,100,000
Penobscot	2,000,000
Bangor	1,300,000
Total	9,200,00

Up to a dozen years ago the greater part of all the brick made at these places went to Boston, but to-day only an occasional cargo is shipped to that city, and those usually go from the Orland or Penobscot yards. The product of the Bangor and Brewer yards go to Aroostook county and to supply the home demand, although a few are shipped to Washington county. Those made at the Orland and Penobscot yards go to Penobscot, Union and Frenchman's bay ports. This summer practically the entire output of the Orland yards will be used in Bar Harbor.

Henry Harlow, of Brewer, a veteran brickmaker, and said to be the most expert burner of brick in the State, says that he has not been so busy for years as he was this summer, so great has been the demand for his services. He further says that it will not surprise him in the least to see the introduction of coal as fuel in brick kilns in Maine in the course of a few years. It will come, he thinks, as soon as the Maine makers come to realize how good a burn can be had from the use of coal.

As he has used the fuel in the West, where he burned many kilns of brick, Mr. Harlow is in a position to know whereof he speaks. At the present time the only thing which will prevent the adoption of coal as fuel will be that suitable kiln wood can be secured cheaper.—*Augusta Journal.*

The Humble Cottages of Laborers Should be of Brick.

Editor Clay-Worker:

Referring to Mr. Ryan's letter in September Clay-Worker, containing suggestions for sand-lime brick promoters, we take pleasure to state that we fully appreciate Mr. Ryan's suggestions to form subsidiary companies to build one-story cottages for the steady workmen employed in our factories. This is being done at Atlantic city, where the company is erecting a row of two-story buildings out of their bricks close to the factory.

It would also be a good idea if this matter would be taken up by all other companies engaged in the manufacture of our brick; the only hindrance which would be found is that in most cases a one-story building would house all the workmen such factories employ. As a rule, one of our standard plants does not employ more than about eight to ten workmen in all, and whenever the plant is located near a city, as in most cases, such workmen have their own homes and families and do not wish to make a change.

For concerns operating factories of larger capacity, of course it would be a different matter, and we trust that Mr. Ryan's suggestion will be taken up by those who employ a greater number of workmen, and where the local conditions call for such improvements as suggested.

H. Huennekes Company.

New York, N. Y

Brick Prices at Breslau.—At the last meeting of the Breslau Brick Manufacturers' Association the price for common building brick up to May 1 next was fixed at 28 marks per thousand ($6.58), delivered at building.—*Deut. T. and Z. Z.*

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

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One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

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☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

VOL. XLII. OCTOBER, 1904. No. 4.

CURRENT COMMENT.

It is a wise man that knows the clay he works, and knows how to work it.

* * *

The greatest handicap to improvement is for a man to get the feeling that he is already improved.

* * *

The oldest head in the business may get pointers now and then from the youngest, but he must be willing first.

* * *

Our good points may be overlooked, but if we've got any bad ones, the searching eyes of our critics will certainly find the goods on us.

* * *

Opportunities are sometimes like Missouri mules, if you don't know just where to take hold of them and how to handle them you may get the worst of it.

* * *

It is said that ambition brings trouble, but it is really the greed which we sometimes mistake for ambition that is responsible for most of our troubles.

* * *

It is not always the man that knows the most that does best, but still, knowledge of clay is a mighty good thing to have, and it is impossible to get too much of it if one would make a pronounced success in brick making.

* * *

It is all right to look for certain clays for special purposes, but it is also a good thing to look closely into the clays we have at hand and figure out what can be made from them to the best advantage, for sometimes a man may overlook a gold mine while in search of a bee tree.

* * *

You should lay immediate hold of every opportunity, but everything that comes along the road must not be taken for an opportunity. Some things that look good as they come along prove to have many of the characteristics of a balky mule when we undertake to turn them to account. Make sure it is an opportunity first, then lay hold of it.

THE NEXT NATIONAL CONVENTION.

The Official Announcement on page 366, telling of the selection of Birmingham, Ala., for the next National Brick Manufacturers' Association Convention, will be read with much delight by many of our readers, we know, for there is a strong feeling in favor of a meeting in the South. This was well expressed by a Chicago member who, on meeting the Secretary some time since, said: "Take the Convention somewhere South, Randall, and let us have a little respite from the snows and blizzards of midwinter. A few days of sunshine will do us all good, so go South—you cannot go too far to suit me—but *go South.*" Birmingham is far enough South to insure mild temperature Convention week, and still not too far South for the busy worker whose time is limited; besides, it has many charms that will appeal to all of us, especially to those from the North.

IN MEMORY OF BRIAN J. DUNN.

> " While a lift at humanity's wheel you can give,
> Or a tear you can wipe from your eye,
> Get ready, my brother, *keep* ready to live,
> But never get ready to die."

These are the words with which "The Dreamer," Brian J. Dunn, closed his final contribution to our columns. They accord well with the life and nature of that good man—and "The Dreamer" was a good man. Large-hearted, broad-minded and jovial by nature, he was endowed with a love of his fellows that made him a most charming companion and a helpful and true friend. Of humble parentage, he by sheer force of intellect and energy won an enviable place for himself in the profession of law. He never forgot or ceased to love the work of his youth, which was spent on his father's brickyard. "The glory of the kiln fire" always appealed to him, and it was his intention and ambition to some time own and operate a brick plant of his own. His untimely death is a great loss to the community in which he lived, and to the brickmaking craft, to the literature of which he contributed generously. To those of us who have enjoyed his witticisms and rhymes, the name of Brian J. Dunn will ever be a pleasant memory.

THE SUNNY SOUTHLAND.

"Me for the Sunny South" is suggestive of the thoughts of the average brickmaker these days, when the mind turns to the subject of the next meeting place of the National Brick Manufacturers' Association. Birmingham, Ala., is a most attractive Southern city, and besides, is the home of the humorist of the association, who stated at Cincinnati, with peculiar inflection, that they make iron, and *steel* for a living in that great southern metropolis. That they make iron is graphically demonstrated in the Palace of Mines and Metallurgy at the fair, as all who saw that massive iron Vulcan in the Alabama display will attest. In fact, it not only indicates iron, but it also tells of enterprise, and enterprise of the up-to-date kind, the kind that characterizes the South today. And all through the big exhibition palaces at the fair there were things to be seen by those in attendance at the meeting over there that bear testimony to the enterprise and great possibilities of the New South, demonstrates that the New South has arrived in reality, and is no longer a dream of its enthusiastic champions among the writers of the day.

Moreover, while all the dreams of these enthusiasts may not show up true to life in reality, and while all the spots of southern landscape are not as beautiful as those painted in the literature of some of the railway boomers of southern lands, still many of the great things dreamed of and waited for by Colonel Carter are realities now. The South is taking on its old-time splendor, but in a different form and in greater quantities; it is, in short, the most progressive part of the country in many respects. It is growing in productive wealth at a rate that means not only lots of building operations, but buildings of a substantial character, the kind that calls for brick, iron and stone. People of the north who have invested down there have learned that it is a good country to live in as well as a paying one for investments, so they are moving their families there, building good homes, encouraging schools, churches and other building operations of a pretentious character at an astonishing rate.

The brick men of the country are especially interested in all this from several standpoints. It means a rapid enlargement of the industry down there, offering opportunities for the seekers after new sites, and to the machinery men it means more machines, for the South of to-day turns strongly to modern machinery in its industrial enterprises. And it means a wider market for the manufacture of special front brick and terra-cotta. In other words, it is a development of the kind that seems to help all and hurt none, for it is founded on production from the soil and by digging under the soil.

Then, entirely aside from the commercial aspect, a trip to the Southland is so interesting that every man who has not been there wants to go from a standpoint of historic and romantic interest alone, and those who have been want to go again because they have found the trip worth while.

The city of Birmingham is a peculiarly interesting point itself. The city proper is booked as having a population of about 50,000, but it is surrounded by suburbs that contain about 100,000 more population. Some of these suburbs are resident sections, pure and simple, but most of them are the manufacturing centers, where the big iron plants are located, and all of these suburbs and the city proper are coupled together with electric lines of the high-speed class that make it as convenient as if it were one solid city. And the way the population from these suburbs swell the throng on the down-town streets, especially Saturday afternoon and night, is a sight you don't see in any other city in the country except when there is something special on in the way of an attraction. It is a sight worth seeing, but it is only one of the many things that go toward making a trip to the South worth while, some of which we will recount later on.

BAD ASPHALT STREETS CAUSING TROUBLE IN ATLANTA, GA.

The city of Atlanta, Georgia, is having serious trouble as a result of the bad condition of her principal residence thoroughfare, Peachtree street. It was paved with asphalt a few years since, which has been worn in holes and ruts until now it is unsafe to drive over. One of the leading physicians of the city was seriously, possibly fatally injured a few days since by being thrown from his auto, the wheels of which ran into a deep rut. A heavy suit for damages against the city will probably result. The local press is criticising severely the city officials for failing to have the street put in proper repair. A better thing for them to do is to repave the street with brick.

CLAY PRODUCTS OF THE UNITED STATES IN 1903.

As man himself, according to Biblical story, is the chief of all clay products, it is fitting that he should take a special interest in other commodities fashioned from the soil. That his interest does increase in this country from year to year is shown in a recent publication of the United States Geological Survey. It is a chart illustrating the output of clay products in the United States during 1903, which was compiled by Mr. Jefferson Middleton. It gives the total value of the clay products for 1903 as $130,962,648, as against $122,169,531, the total value for 1902.

Included under the head of clay products are common brick, which had a value of $50,532,075; front brick, valued at $5,308,908; vitrified paving brick, worth $6,453,849; fancy or ornamental brick, valued at $892,256; including enameled brick, worth $569,689; fire brick, with a value of $14,062,369; drain tile, valued at $4,639,214; sewer pipe, valued at $8,525,369; ornamental terra cotta, worth $4,672,028; fireproofing, valued at $2,708,143; hollow building tile or blocks, valued at $1,153,200; tile, not including drain tile, worth $3,505,329, and pottery, valued at $25,436,052. Under the caption of miscellaneous clay products, worth $3,073,856, are included adobes, aquarium ornaments, assayers' furnaces, boiler and locomotive tile and tank blocks, burnt-clay ballast, carboy stoppers, chemical brick, chimney radial brick, pipe, and tops; clay furnaces, retorts, and settings; crucibles, cupola lining, curbing blocks, electrical conduits, fire mortar, flue lining, gas logs, glass-house supplies, grave markers, muffles, oven tile, paving block, runner brick, saggers, scorifiers, sectional sewer blocks, stone pumps, tunnel and well bricks, and wall coping conduits.

The States which are the leaders in the manufacture of clay products are Ohio ($25,208,128), Pennsylvania ($18,847,324), New Jersey ($13,416,939), Illinois ($11,190,797), New York ($9,208,252), Indiana ($5,694,625), and Missouri ($5,661,607). Ohio's supremacy lies in the manufacture of pottery, the value of its pottery production for 1903 having amounted to $11,088,087. Ohio also leads in the production of tile and sewer pipe. Pennsylvania is the chief producer of common brick, the value of its production for 1903 having amounted to $6,174,437. Illinois, with a production of common brick valued at $5,388,589, stands second in this list. New Jersey excels in the production of ornamental terra-cotta ($1,364,094) and fireproofing ($1,256,002) and comes second in the production of pottery ($6,315,226).

TECHNICAL JOURNALISM OF THE FUTURE.

The rapid growth of technical journalism and the demand for the elevation of its standard, is noted by the *Mining Magazine*, of New York, and the scope and character of the technical journal of the future is thus well outlined.

In the first place, it will be more truly *scientific*. The emphasis will be laid upon the results of investigation rather than upon finely spun theories—upon principles rather than hypotheses. For this class of work writers of the scholarly type, endowed with an investigating turn of mind and accustomed to accurate, systematic grouping of facts, will be in demand.

At the same time, the technical journalism of the future will be *practical* in every sense of the word. It will keep in view the needs of the man in the field, as well as the man behind the book. The superficial professional writers, who haunt every editorial office, should be relegated to the background, for every contribution of a practical nature should have years of experience back of it.

The technical journal of the future will also be more *literary*. Practical information in any form may serve a useful purpose, but the busy man of to-day desires that even his technical literature shall be "easy to read."

With reference to the method by which this standard is to be realized, the following opinion is expressed:

The attainment of this ideal of a technical journalism which shall be at once scientific, practical and literary involves radical changes in editorial and business management. No single man in the editorial chair, however gifted or experienced he may be, can meet in himself all the demands of the future. An editorial staff is called for, every member of which should be a specialist in his own department.

Largely increased capital will also be necessary for the maintenance of such a staff, for the remuneration of high-grade contributors and for improvements in the mechanical appearance of the publication. But when all the demands are met by writer, editor and publisher, the finished product will be worthy of the individual industry which it represents and will strongly appeal to the pride of every man interested in its development.

DID HE EVER WHACK UP?

We hear an awful lot about the big, good-hearted cuss
Who bears a reputation of being generous.
"Why," says a friend, "that man would lend you his best coat or shirt or collar,
And, if need be, as gaily he would whack up with you his last dollar."

His friends are always telling how he throws his coin away
On false fair-weather friends, who pull his leg, day after day.
"Why, say,'" says one, "that fellow's mon flows onward like a golden river!
He likes, you know, to have it so, since God so loves a cheerful giver."

They say that this big, good-hearted cuss would forfeit his last sou
If such a sacrifice would be a favor unto you.
He *would*, they say, give up his pay, and never for a moment rue it,
But tell us this—the proof we miss—who ever saw the fellow do it?
—*Exchange.*

Wants Dry Press Machinery.

DEAR FRIEND RANDALL.—Enclosed find my check for THE CLAY-WORKER for another year. I could not do without it, so don't ever cut me off the list. Business has been fairly good this year. You can tell your readers that I am in the market for a dry press brick machine.
J. J. HOFFMAN.
Milan, Mo.

Machinery Wanted for New Canadian Plant.

Editor CLAY-WORKER:

This company is breaking ground for a big new plant of 200,000 daily capacity, and we would like you to mention in your next issue of THE CLAY-WORKER that we are in the market for dry presses, stiff mud machines, dry pans, etc., and all modern brickyard appliances. We will build eight continuous kilns. We have two good systems of continuous kilns now, but we are after something better that will save more fuel and turn cut better bricks, and we will pay liberally for any system that will do this, if it can be had.

THE LAPRAIRIE BRICK COMPANY, *Ltd.*,
La Prairie, Quebec. WM. BAILLIE, SUPT.

Will Not Build Brick Plant at Logan, Ohio.

MY DEAR RANDALL:

I wish you would tell your advertisers that I am not going to build a brick plant at Logan, Ohio. Some one went down there and impersonated me, evidently with the intention of deluding some one into taking hold of a piece of property in that vicinity.

The whole thing was too glaring to be overlooked, and as soon as my attention was called to it, I made the paper publish a denial of the whole story and give me the names of the parties who published the original story, which I am holding to see if any one has been duped by the article. The story got around to the machinery men, and I am being flooded by letters, etc., which, not having Uncle Sam's franking privilege, I do not feel like answering.

I passed through your city a short time ago, and after *buying a lunch* at the depot, forgot for the moment where I was, and asked the man the way to the World's Fair.

Columbus, Ohio. ELLIS LOVEJOY.

Will Make Stiff Clay Brick, Not Sand-Lime Brick.

Editor CLAY-WORKER:

Permit us to thank you for your kind mention of our proposed sand-lime plant in your last issue, but we have given up the sand-lime idea for the present, and in its stead have leased the Callery Junction Brick and Tile Works, located at Callery Junction, Pa., seventeen miles from Pittsburg. The plant is modern and up to date in every respect, almost new and has a capacity of 40,000 per day. We have an excellent vein of fire clay eighteen feet thick and our own coal underlying our clay bank. It is our intention to manufacture all grades of fireproofing and wire-cut repressed face brick, also common and paving brick. We feel that we are quite a long way from home, having been in the brick business in Texas for about seventeen years, but we will be glad to welcome any of our brother clayworkers who can come this way any time. W. J. CARTER & SON

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IT IS MY AIM to do whatever is given me a little better than it has ever been done before.
WILLARD D. RICHARDSON,
Consulting Engineer to the Brick Industry.
See pages 399 and 403.

WANTED, FOR SALE, ETC.

FOR SALE—A Remington typewriter in good condition, used less than a year. Price, $60.00, C. O. D. Address MANGANESE,
Care Clay-Worker.
10 tf d

FOR SALE—One American Clay-Working Machinery Co.'s end-cut automatic brick cutter. Used thirty days. Reason for selling, making side-cut brick. Enquire of
THE BARR CLAY CO.,
Streator, Ill.
9 1 d

WANTED—Someone with capital and experience to develop the brick industry. Every clay known to the trade is here. Exceptional opportunity. For particulars address
CITY CLERK,
Newport. Wash.
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THE ROODHOUSE IMPROVEMENT CLUB solicits parties desiring a location for the manufacture of pottery ware, sewer pipe, brick or tile. Inexhaustible deposits of fine clays. Good water and coal. Our city is centrally located on the Chicago & Alton and C., B. & Q. Rys. Terminal of Chicago-St. Louis-Kansas City division of the C. & A. Rys. Address
C. W. PAYNE,
Industrial Sec'y, Roodhouse, Ill.
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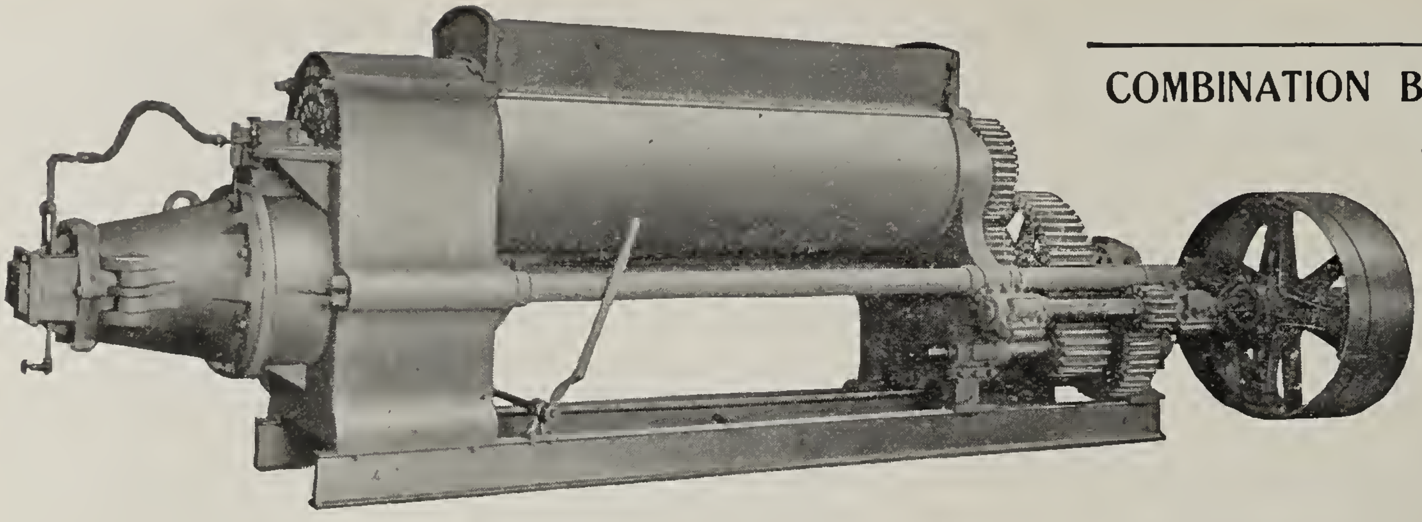
For Sale, Wanted, Etc., Ads Continued on Pages 393.



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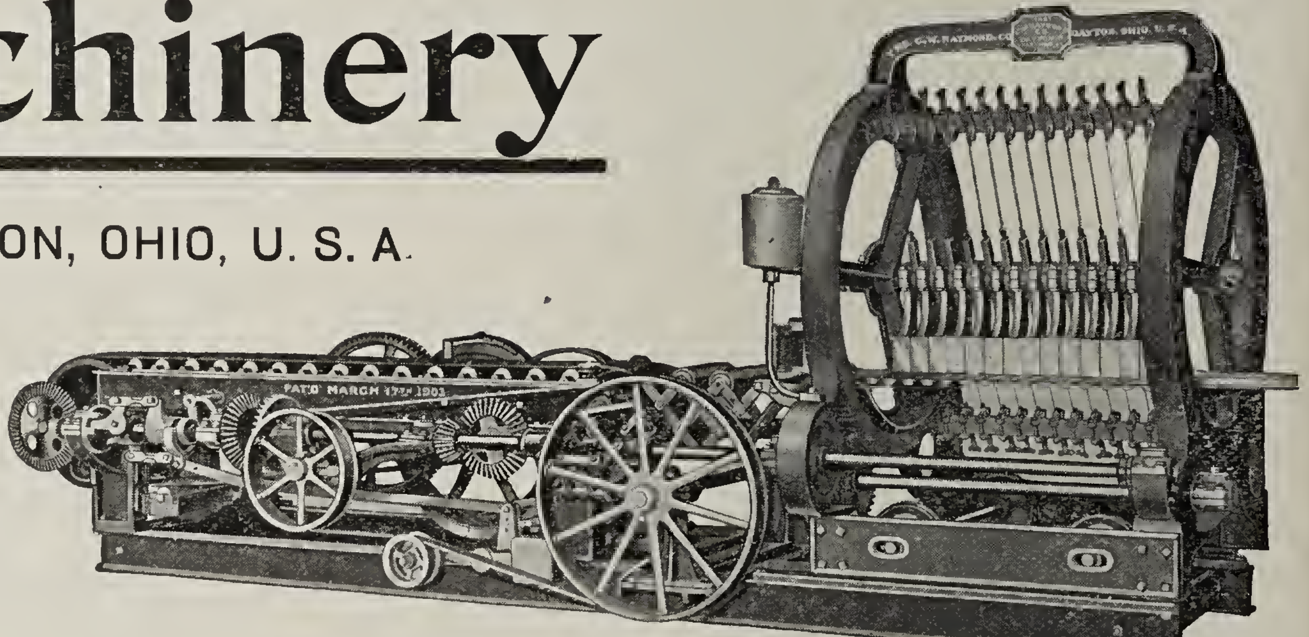
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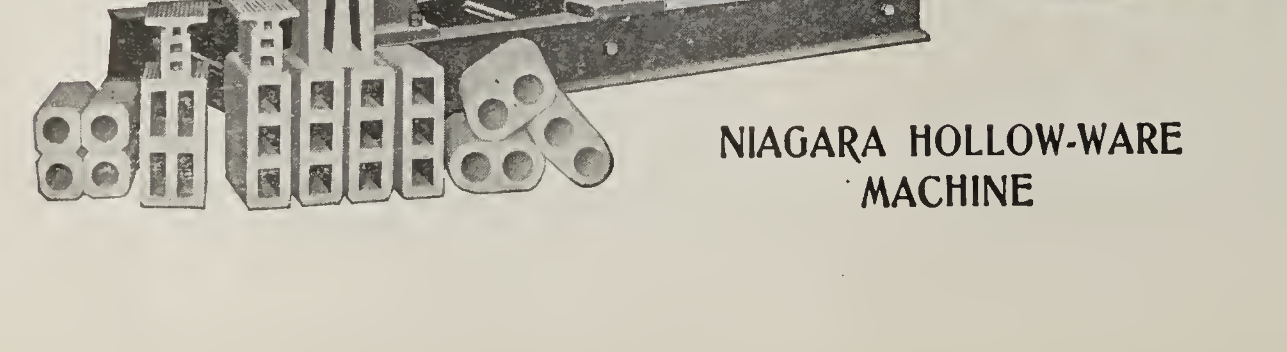
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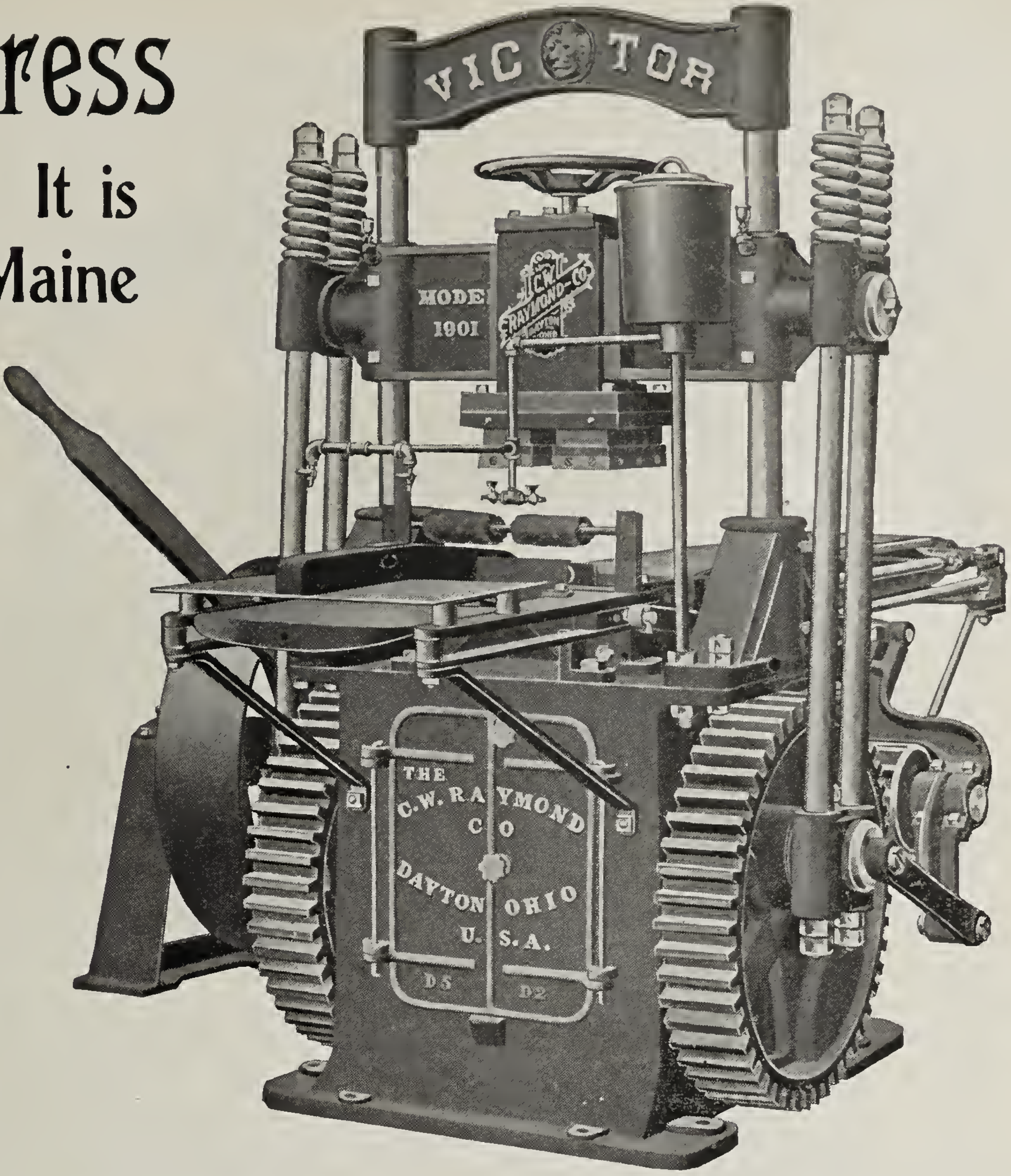
NIAGARA HOLLOW-WARE MACHINE

Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

The Victor Re-Press

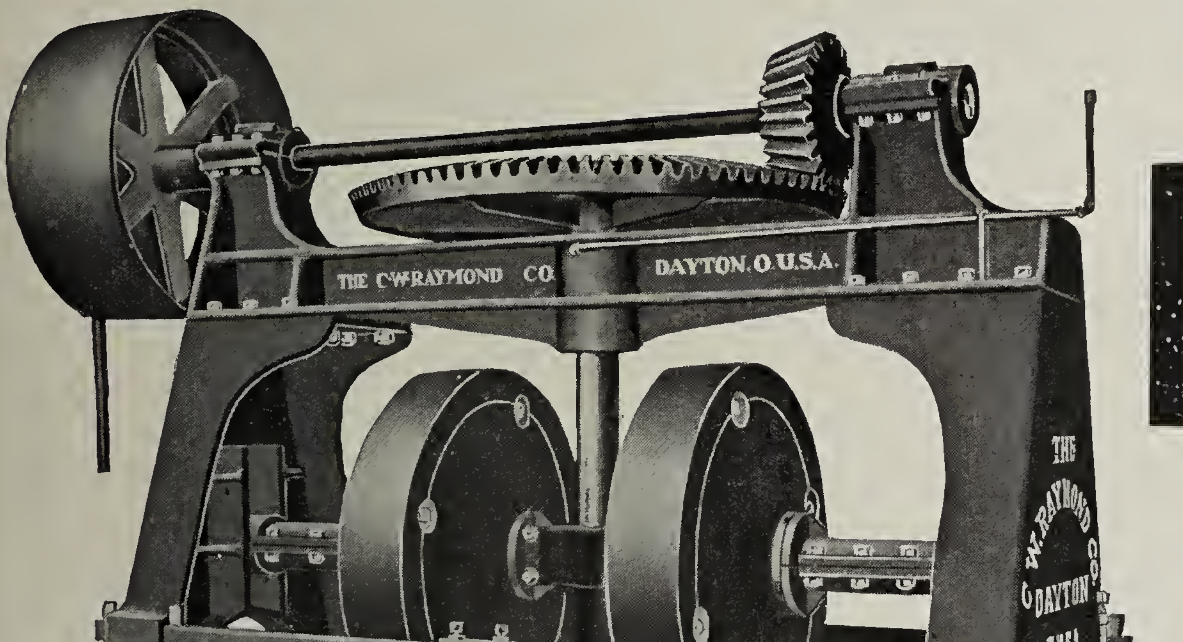
needs no introduction. It is known and used from Maine to California, ⁎ also, somewhat in Europe, Asia and Africa.



Our Dry Pan

has more crushing power, and more screening surface than other pans--heavier too

Investigation will Prove it.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DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street

ST. LOUIS,
315 Frisco Bldg.

PITTSBURG,
1425 Park Bldg.

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING NEWS.

EVERY BRICK firm in this city is finding a market for its product without any trouble, and on the other hand, most of them could sell a good many more brick than they can make. There has been a vast amount of building this year, especially small work, and the season has been a fine one for working, and this month is even expected to be about as good for brickwork as September. In the month of September there were 444 building permits issued in this city, the total amount being $859,045. Of these permits 47 were for brick buildings, the value of which was placed at $362,990. The permits exceeded the September, 1903, permits by 87, the number a year ago being 357, representing a cash outlay of $567,870, against $859,045 for this year.

The activity in building has been paralleled by the activity in the demand for sewer and paving work, and a large number of contracts have been placed, especially in the paving line, which is bringing activity to the brick paving contractors. In times past there has been a great deal of spread made over street paving, and asphalt was used in most cases, but the alleys, which were out of sight of the general public, were neglected very much. At the present time there is a movement towards having all the down-town alleys paved with brick. A good many of these contracts have already been let, and others are to follow. It has been predicted by the office of the city engineer that by this time next year every alley between Broadway on the west and Benton boulevard on the east will be paved with brick, and it is figured that this improvement will keep the paved streets much cleaner, for the most of the dirt which accumulates on the paving has always been charged up to the unpaved alleys.

The office of the city engineer is now preparing an estimate of the cost of a combined sanitary and storm water sewer system for the Westport district, where, in many places, there are only small sanitary sewers. Engineer Pike says the cost would probably be in the neighborhood of $400,000.

James G. Glennon, of the Kansas City Paving Brick Company, has just returned from a very satisfactory visit to the World's Fair. He reports finding a big demand for their product upon his return and a great deal of work in sight. His company is supplying a good many of the local paving contractors with brick, as well as several large contracts in other cities.

James W. Flanagan, of the brick manufacturing firm of Flanagan Bros., has been spending several weeks on a pleasure trip to St. Louis, taking in the Fair, etc.

All the plants of the Pittsburg Brick Company are reported to be extremely busy, and they have been compelled to turn down several orders of late, at even advanced prices, on account of having their product all contracted for, in the particular line of brick wanted.

The Dwyer Brick Company is reporting a steady demand for brick, at regular prices, but a great majority of their sales are for small contracts, one of the largest contracts being supplied by them at this time being the common brick for the Baltimore Hotel.

The Kansas City Hydraulic Pressed Brick Company is still very busy taking care of the regular business which is coming their way, and reports everything running smoothly at the plants since their late strike troubles were settled.

Shinnick & Massman are preparing to put in a new dry press within a very short time.

The Kansas City Cement Company, which, to the present time, has devoted its entire attention to the production of the sand and cement building stone, has met with such entire success in selling its product, having furnished the material for a number of large apartment houses, besides some fine private residences, that they have decided to put in the necessary machinery for making the brick. Owing to the fact that their room is rather restricted at the present location, Eighteenth and Walnut streets, that plant will be given over entirely to the manufacture of the stone blocks, and a new plant is to be constructed for the exclusive manufacture of brick, out of the same material. This new plant will be built right away, on the Kaw river, where they will have a switch from both the Frisco and Belt Line railroads, and expect to put up a plant for the easy and economical handling of the material, and thus be in shape to turn out not only a good product, but turn it out at the lowest cost. Hydraulic machinery will be used, and the plant will have a capacity of 40,000 brick per day. R. N. Soper leaves for the East immediately, to buy the new machinery, so they will be able to have a considerable stock of brick on hands before the cold weather sets in. They will have an automatic mixer, and will either have gasoline or electric power, but have not decided definitely as to that.

The Standard Vitrified Brick Company has but recently been organized in Coffeyville, Kas., with a capital stock of $70,000, by a number of capitalists of that city and St. Joseph, Mo. The new company has purchased the old Stark plant, and twenty-one acres of fine shale land. The company is composed of Huston Wyeth, J. A. Johnson, C. E. Woodbury, L. C. Hamilton and D. E. Marshall, of St. Joseph, and the Coffeyville members of the company are W. H. Shepard, J. T. Wettack, Daniel Wells, Daniel Cahill, O. A. Kentner, G. H. Parks and Thompson Black. The company will manufacture paving brick and building brick, and fifty men will be employed.

The first pavement ever laid in Hutchinson, Kan., was put down last month, and a dozen or more blocks are to be paved before winter. Brick is being used.

E. Johnson has been succeeded in business in St. Mary's Kan., by the Johnson Brick, Tile and Cement Company, a new company which has been incorporated with a capital stock of $40,000.

The Houston White Brick Company has been incorporated in Houston, Texas, with a capital stock of $80,000.

C. A. W.

CLAYS IN GREEN COUNTY, ILLINOIS.

From the fact that very little attention has been given to the great raw material resources of Illinois, except in the matter of coal, large deposits of potters clay, fire and brick clays are still unworked. Therefore, we desire to call attention to some very fine and quite extensive deposits of high grade potters clay at Roodhouse.

The special clay has been used in a small way for several years. and its quality is becoming known to the extent that it is being shipped as far west as Kansas. An examination of this deposit leads us to believe that the supply is almost inexhaustible.

There are also equally as great deposits of high grade fire clay, brick and tile clays, also deposits of white and red plastic, or paint clays.

What we need is capital and men with experience to establish plants and convert these deposits of raw material into merchantable products. The states of the great Mississippi valley are among the largest users of clay products, and the opportunity for building plants in the midst of the clay fields, and of a growing market is indeed very good. The saving of freight on raw material, and also on every gallon of stoneware, or foot of tile delivered, adds greatly to the profits in the business.

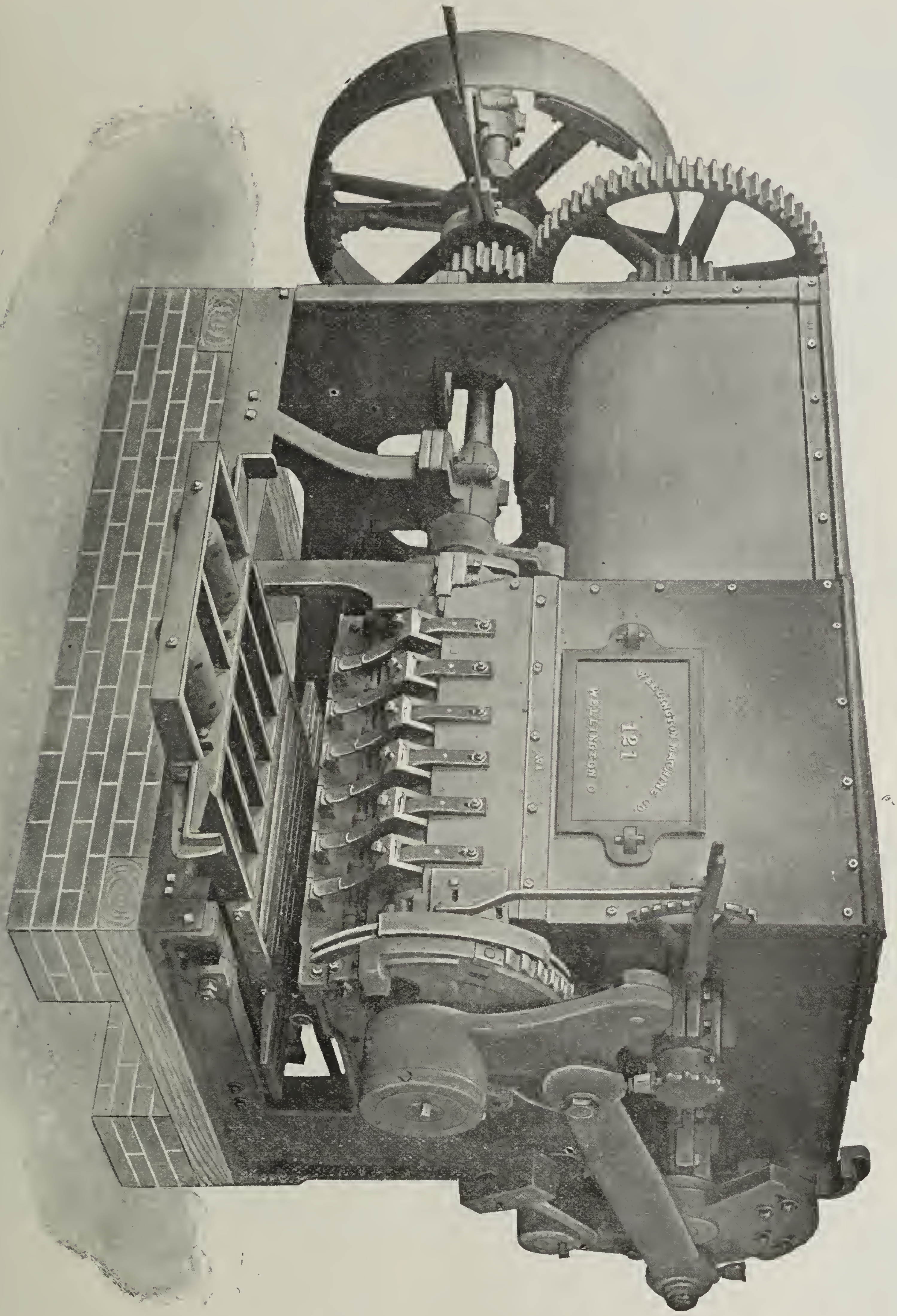
The Greene county deposits are so located that the great West, South and South-West are easy of access; and having good shipping facilities and coal, make this a desirable field in which to establish a plant. Parties desiring additional information regarding these clays or the buildig of a plant, can address C. W. Payne, Roodhouse, Ill.

As a rule, cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted," "For Sale," etc., columns a means of satisfying their needs.

OVER
175
"Monarch"
Brick
Machines
in use.

OVER
500
"Quaker"
Machines
in use.

WRITE
to us
regarding
Disintegrators,
Pug Mills,
Mould
Sanders,
Sand Dryers,
Smooth-roll
Crushers,
Moulds,
Barrows,
Trucks,
Winding
Drums,
Dump Carts,
Elevators,
Dump Tables
and all
kinds of
Kiln
Castings.



The "Big No. 6" "Monarch" Brick Machine.

REMEMBER:
You are losing money wheeling brick unless you have our
ROLLER-BEARING BARROWS.

The Wellington Machine Co.,

WELLINGTON,
OHIO.

Send for Catalogue.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

A HEAVY AND TOTALLY unexpected rain which fell in September and lasted for four days did a a great deal of damage in the drying yards throughout the State. Previous to the rain the weather had been so warm that manufacturers were encouraged to put out a large amount of brick for drying. At the yards of the Wheeland Brick Company, 175,000 brick were soaked back to the native clay, which makes a total of 240,000 lost by them on account of unexpected rain this summer. It is reported that during the last heavy rain the Remillard Brick Company lost 400,000 brick, and other concerns having open yards met with proportionate losses.

The Steiger Terra Cotta and Pottery Company is now handling the lines of the American Enamel Brick and Tile Company, which they are doing well with. They are using 45,000 of this company's brick in the Minifie building, corner of Powell and O'Farrell streets, and 17,000 of the same brick for a new building in San Jose, Cal. The company reports that work is picking up now and is already much better than during the summer. Light red, brown, white and cream colors are mostly in demand. There is a particularly lively call for red pressed brick, which seems to be coming into favor again. The brick and terra-cotta work on the five-story First National Bank building in Berkeley, Cal., has been completed.

The Wheeland Brick Company is installing a dryer which will enable them to make brick all the year round and double the output. Mr. Wheeland of the company died in this city September 10.

The Steiger Terra Cotta Company at South San Francisco is putting in another kiln, owing to the increase in their business. They are also building another large smokestack, as the two now in use are overtaxed with nine kilns that are constantly burning. The company intends to add three additional kilns in the near future, in order to handle orders that are continually turned away.

Notice has been served on the Independent Brick Company of Los Angeles, Cal., which has the contract for supplying the city of Los Angeles with $130,000 worth of sewer brick, that it must immediately furnish 1,000,000 sewer brick. The notice states that if the brick are not immediately forthcoming, the city will buy them in open market.

Peter Tracy now has a kiln of about 45,000 bricks burning at his brickyards at Arcata, Cal. They are for the new sewer system and were purchased by the Stanley Contracting Company. About 200,000 bricks have already been burned this year, and there are about 100,000 more green ones in the shed that will soon be put in the kiln.

Both the Holland and Golden Gate Brick Company, of Antioch, Cal., are making large shipments of brick to Merced, Stockton, Oakland and San Francisco.

W. J. Carter, of Paris, Texas, expects to establish a brick factory in Roswell, N. M., in the near future. He will also engage in the manufacture of tile shingles, tile weatherboarding, tile roofing, ceiling, flooring and everything in that line. He has been engaged in the manufacture of brick at Paris, Texas, for twenty-five years, and has recently disposed of his interests there.

The Sunset Brick and Tile Manufacturing Company, at Santa Monica, Cal., has enlarged the capacity of its plant. The fifty-thousand capacity brick machine at first put in has been replaced by a new and heavier one which has a capacity for making 100,000 bricks per day. The company is now burning 600,000 vitrified bricks for the Los Angeles storm sewer. Other orders are in hand that will keep the force busy during the entire winter. A sewer pipe press and a machine for making roof tiling will be installed in the near future. The clay in the vicinity of Santa Monica is specially adapted to the manufacture of brick and hollow ware.

The Wilson-Lyon Company has installed a brick manufacturing establishment on the Belt Line at Point Richmond, Cal., and equipped it with the latest class of machinery. This plant is now running full blast, turning out 40,000 pressed brick a day. Several other large brickmaking establishments are locating in the vicinity of Point Richmond, and there is no doubt but that Point Richmond brick will soon become a staple building article throughout the State. One of the crying needs of Point Richmond heretofore has been a sufficient supply of brick. Although the bulk of the building in the past has been frame structures, the tendency now is to use brick, making the buildings of a more substantial nature.

The United States Indian School at Santa Fe, N. M., is advertising for bids for furnishing 75,000 brick. Clinton J. Crandall is superintendent.

The Hanford Brick Company recently opened a large kiln of brick at the new yard south of Hanford, Cal. They purchased fifteen acres of ground there and say the composition of clay found on it makes some of the very finest brick. They now have about 200,000 burned and ready for use.

J. M. Martin and J. J. Mack, proprietors of the brick works west of Eugene, Ore., intend to purchase a dry press for the manufacture of pressed brick at their plant. They report the brick business to be good this year, and prospects are growing better all the time. They have a kiln of 225,000 brick now ready to burn.

Horace G. Smith, John E. Smith and Fred R. Smith have incorporated the Smith Cement Brick Company, at Tacoma, Wash., with a capital stock of $10,000. Aside from making brick and tile, the company is authorized to engage in a general contracting business.

The Palouse Pottery Company of Palouse, Wash., has begun constructing its new kiln. The fire brick is arriving from the Washington Brick and Lime Company of Spokane. The new kiln will be just west of the present one. SUNSET.

San Francisco, October 5, 1904.

A POWER OF THE FUTURE.

THE EXHIBITION of power, from a human standpoint unlimited and almost irresistible, which was seen in the Twin Cities of Minnesota and in various sections of the Northwest lately, says an exchange, was an object lesson in energy, wasted or worse.

Theorists have speculated and experimenters have developed endless patience and ingenuity in suggesting or inventing substitutes for the steam engine. A great manufacturing institution has just published a pamphlet descriptive of its products, entitled, "The Four Powers"—steam, gas, electricity and water, but the greatest power of all, wind power, is not mentioned in that list and is but little used.

The winds, kept in motion by the never-failing power of the sun and given direction by the revolution of the earth, are set to pigmy tasks of pumping water and sometimes leisurely grinding grain, whereas they might move all the machinery and heat and light all the habitations of the world.

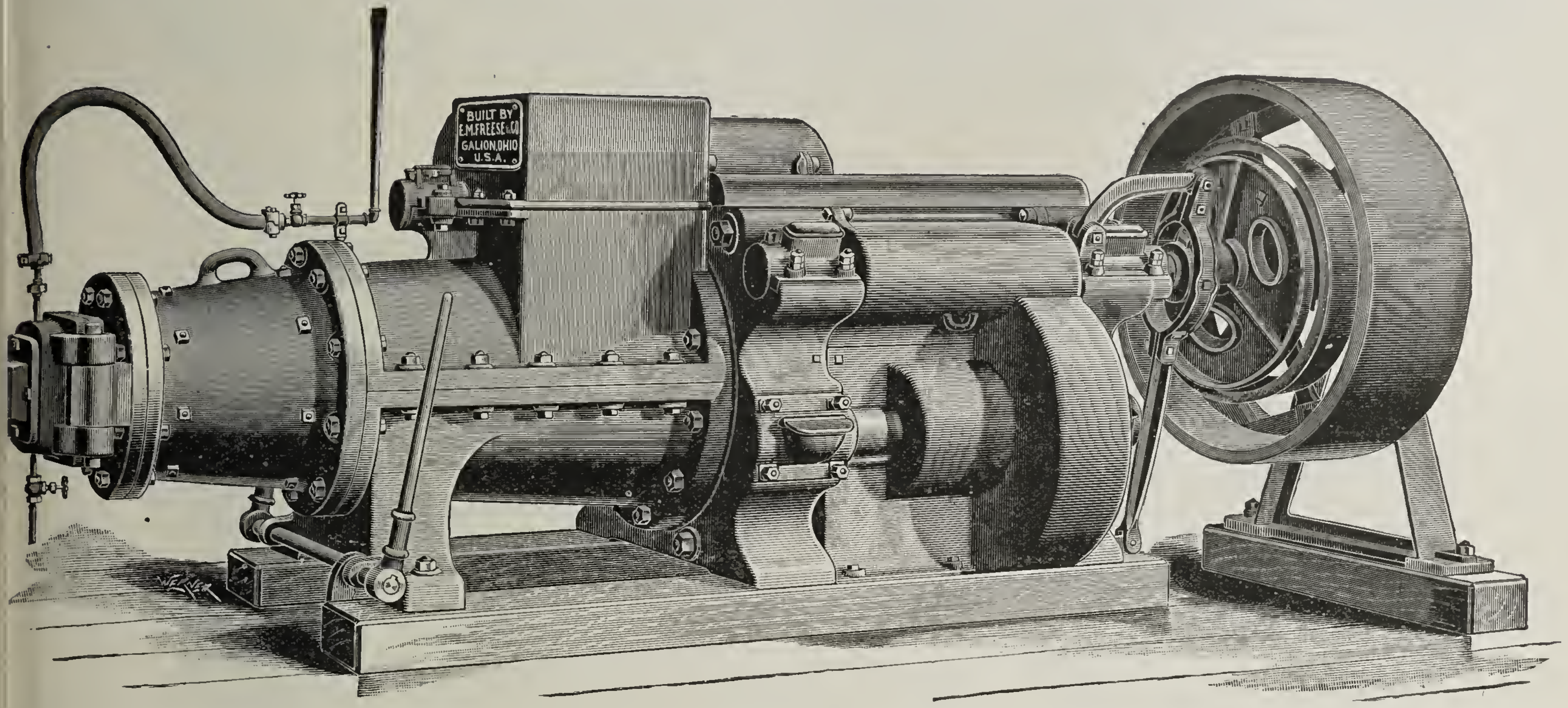
What the development of this power is waiting for is an economical and durable storage battery. It is a variable power and must be stored, to be given out as needed. A wind-mill can drive a dynamo and the dynamo can charge a battery, but the storage battery of to-day is too costly and short-lived to be an economic proposition in competition with water and coal. But what is a possibility of one day becomes the probability of the next, and an accomplished fact the next.

Multitudes of experimenters are working towards the simplification and improvement of the storage battery, and we can not doubt that they will succeed. When they do, electricity generated by the winds will, we believe, take first place in nearly all places where heat, light and power are required.

The power is limitless; all that is needed is some method of storing it. When that time comes, the farmer can heat and light his house by a wind engine located on his place. The cities can be lighted and heated in the same way, only on a larger scale; trains will be driven by power generated along the right of way, mines will be operated by the same power, and it is not at all certain that even ore smelting and the heating in roller mills may not be done by electricity.

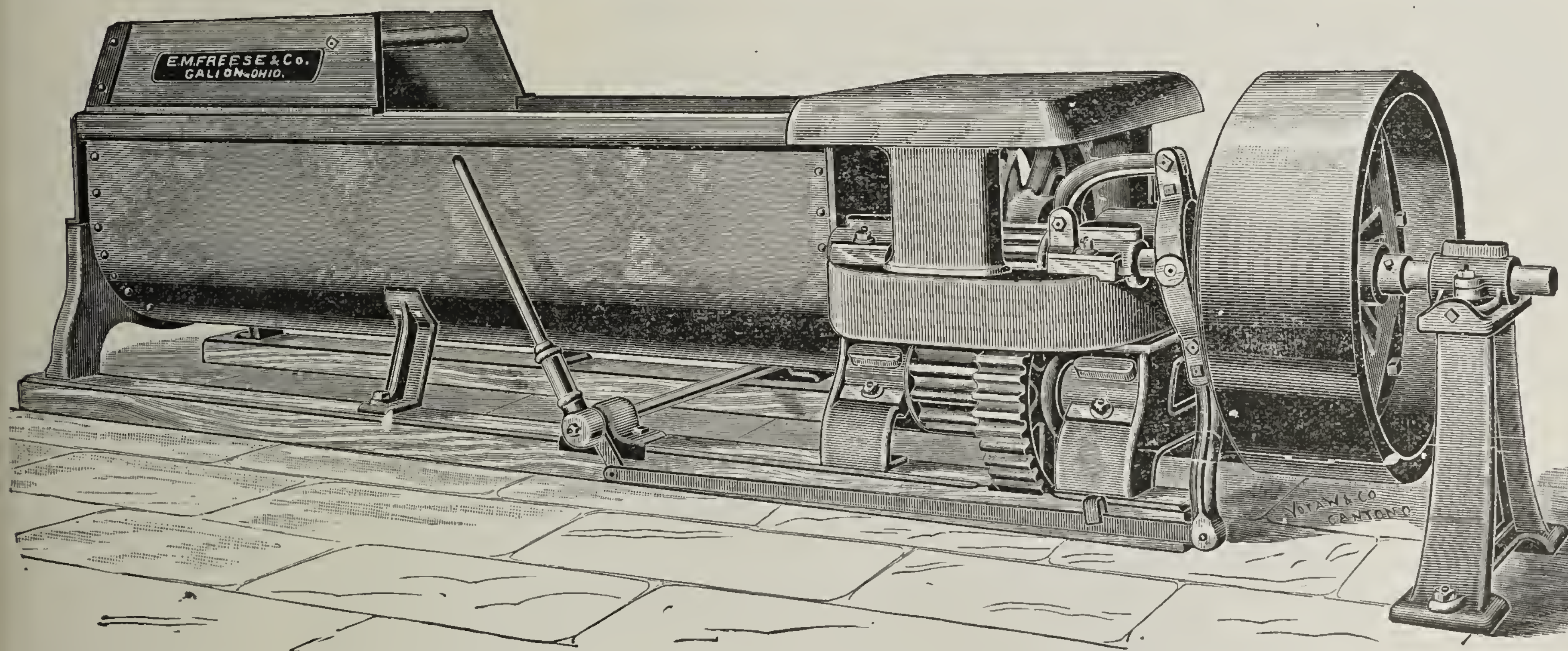
It is all well enough to find substitutes for coal and to harness the water power of the country, because the time of the winds has not yet come; but when it does come, then men may cease to worry about the waning coal supply.—*Exchange.*

Our Mammoth Brick Machine


BUILT BY
E.M.FREESE & CO.
GALION, OHIO
U.S.A.

THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

Our Pug-Mills Have Features of Great Merit.

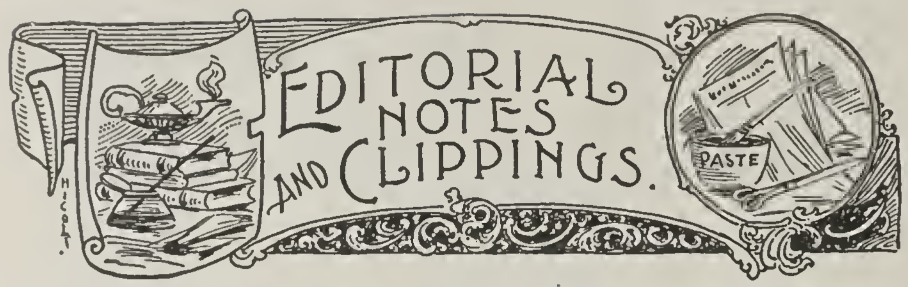

E.M.FREESE & Co.
GALION, OHIO.

THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 428 and 429.



ART AND ADVERTISING.

In olden days the sculptor modeled
 In pliant clay his inspirations,
Then from the peerless Parian carved,
 Stroke upon stroke, sublime creations.
But now clay modeled advertisements
 In business fields have proved a winner.
(The art has passed, these latter days,
 From Michael Angelo to Binner.) —*Ex.*

The William Grove Brick Company, William Grove, Pa., has been organized with $60,000 capital stock.

Beale & McElrath are building a fine brick plant at Paris, Tenn., where they have a fine deposit of clay.

J. M. Crabills' brick plant at Clarinda, Iowa, was slightly damaged recently by fire which started in the kiln shed.

An overheated kiln at the Perot plant of the Baltimore (Md.) Brick Company caused a $600 fire recently.

The Estacada Brick and Tile Company has been incorporated at Portland, Ore., with $75,000 capital stock.

The Weston Brick Company's plant, at Weston, Ore., was completely destroyed by fire recently. It will be rebuilt.

The Mayo (N. D.) Brick Company is a new concern recently organized to establish a brick plant of 50,000 daily capacity.

H. W. Marsh and George E. Anthony are organizing a company at Manistee, Mich., for the manufacture of brick.

The Kushequa Brick Company has been organized to manufacture brick at Kushequa, Pa. They have $50,000 capital stock.

Adams Bros. & Co. have started work on a modern brickmaking plant at Bristol, Tenn., on which they will spend $10,000.

The Wilson-Lyon Company has installed a brick manufacturing plant at Point Ridmon, Cal., with a daily capacity of 40,000 pressed brick.

The Mathiason Brick and Tile Company has been organized to manufacture brick and tile at Mathiason, Ala. They have $10,000 capital stock.

T. F. Spencer, Salem, Ill., writes that he is going into the brick business at that point and will be pleased to receive catalogues of machinery and appliances.

John G. Huston, of the brickmaking firm of Huston & Dodd, Mena, Ark., died at his home in that city September 29 of heart failure. He leaves a wife and three grown sons.

The Traverse City Brick Company, Keystone, Mich., has increased its capital stock from $12,000 to $15,000. The additional capital will be used in improving the present plant.

The Mt. McKay Brick and Tile Company has been incorporated at Toronto, Canada, with $40,000 capital stock, by K. O. Brune, F. and J. Waldberg, R. Nelson and M. Egeberg.

J. N. Miller, of St. Joseph, Minn., has purchased the Fort Dodge (Iowa) Clay Works, paying $60,000 for same. Mr. Miller will at once move to Fort Dodge and give the plant his personal attention.

The Hudson Pressed Brick Company has filed articles of incorporation. They will build a brick plant at Hudson, N. Y., this winter of 140,000 daily capacity—120,000 common brick and 20,000 pressed brick.

E. L. Minard & Co., Elma, Wash., have purchased the Elma Brick and Power Company's plant from the former owners, Foxley Bros & Larmer. They are operating to their full capacity, turning out a first-class product.

The Standard Brick Company of Mound Valley, Kan., capital $50,000, has been organized by George R. and George W. Freeman, of Elk point; Chris N. George and William Jepson and A. D. Jones, of Sioux City, and George F. Hammer, of Parsons, Kan. The company did not elect a provisional board of directors, but placed preliminary matters in the hands of Mr. Jones and Mr. Hammer. Directors and officers will be elected in the near future. They will at once put an immense modern plant in operation.

Karr, Nichols & Rankin will erect a brick manufacturing plant at Schuyler, Neb.

The Tilton Pressed Brick Company has been incorporated at Green Bay, Wis. E. E. Tilton, O. F. C. Tenner and F. Tilton are the incorporators.

The Vulcan Brick Works, at Iron Mountain, Mich., have a very prosperous year. They have sold over 1,000,000 brick and still have a good stock on hand.

The Minden Brick Works, in the name of a new company, recently incorporated at Minden, Neb., by H. Hapeman, R. S. Trumbull and Neel and George F. Milbourn, with $10,000 capital stock.

Samuel Walwig, A. Spoor and W. D. Potter, of Milwaukee, Wis., have started a sand-lime brick plant at Janesville, Wis., or, as they call it, a "silicon brick and stone" plant. They have a capacity of 20,000 brick a day.

The Federal Clay Company, Perth Amboy, N. J., will erect a large plant at Moscow, Russia, for the manufacture of clay conduits. Mr. James C. Rossi, superintendent of the Federal Clay Company, will go over to Russia to superintend the work of constructing the plant.

The Covina Brick Company, of Coyoacan, Mexico, will furnish the 10,000,000 brick to be utilized in the construction of the aqueduct which is to be built for bringing the water to Mexico City from the waterworks plant which the municipal authorities are to establish at Xochimilco.

F. H. Griswold, 37 John street, Springfield, Mass., writes that for many years he has been dealing in fire clay cooking utensils, but he now wants to get hold of a special ware, glazed, dark blue outside and white glaze inside, and would like to get in communication with some firm who makes this kind of ware.

The new fire brick plant of the Hayes Run Fire Brick Company, W. I. Harvey, manager, Lock Haven, Pa., is about completed, and the machinery is being placed in position. For the manufacture of fire brick these parties have installed a four-mold Boyd brick press, special, designed especially for making fire brick and furnished by Chisholm, Boyd & White Company, of Chicago.

South Bethlehem (Pa.) men have purchased and put into active operation a brick plant at Bingen, Pa., and have been incorporated under the title of the Bingen Brick Company. Its officers are: Walter M. Weirbach, president; Elmer F. Eberts, vice-president; O. D. Friebely, secretary; S. A. Snyder, treasurer. The plant gives employment to a score of hands and has an output of 20,000 bricks a day.

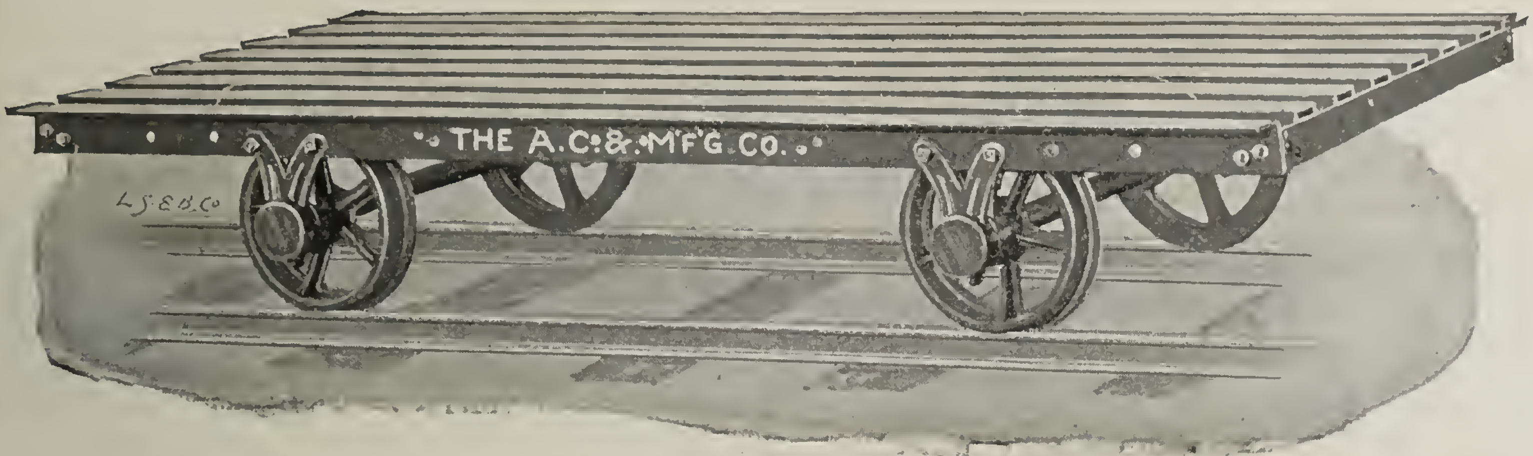
F. W. Dennis, formerly of Atlanta, Ga., writes us from 145 Water street, Norfolk, Va., that he has just completed a 300,000,000 down-draft brick kiln, built under his improved method of construction, for the Nansemond River Brick and Tile Company, of Norfolk. He is much delighted with his success with this plant and says he will be glad to have brickmakers in that section call and inspect the kiln.

Vast deposits of clay have been discovered in Henry County, Tenn., and farm lands that have been abandoned as worthless, have suddenly developed wealth beyond anything that farm products could have bought. The deposits are being worked and the clay is being shipped to pottery and porcelain manufacturers. I. Moudle, of St. Louis, Mo., has purchased one of the largest deposits and is now busy developing same.

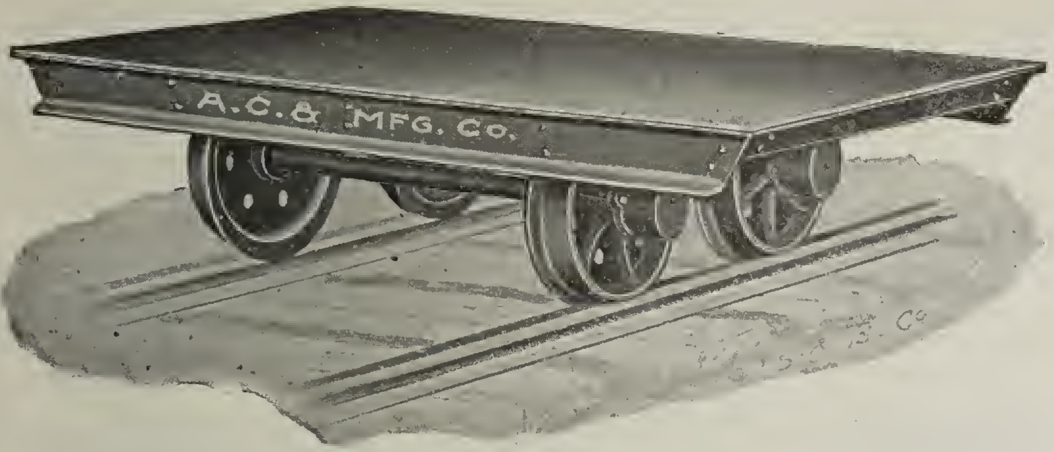
Mr. Ferd Leutz, Hebron, N. D., a well-known dealer in live stock and real estate, has just completed the erection of a modern press brick plant. The work was done under the supervision of R. C. Reynolds, a well-known brickmaker and engineer. The brickmaking machinery, which consists of a '97 model four-mold Boyd press, dry pan and complete outfit was furnished by Chisholm, Boyd & White Company, of Chicago, who also furnished plans for the plant.

Articles of incorporation have been filed by the Raritan Brick Company of Perth Amboy and Matawan, N. J. Twenty acres of clay land have been purchased at Matawan, and work will be started at once on the erection of a large plant there. The incorporators are Thoge R. Eskesen, of Matawan; Theodore S. Brown, of Perth Amboy; Karl Mathiasen, of Keyport; Frederick L. Brown, of Perth Amboy, and Bennet K. Eskesen, of Matawan. The officers are: Thoge R. Eskesen, president; Karl Mathiasen, vice-president; Theodore S. Brown, secretary and treasurer. These three officers constitute the board of directors. The company will have offices in Perth Amboy and Matawan. The new concern will go in for manufacturing on

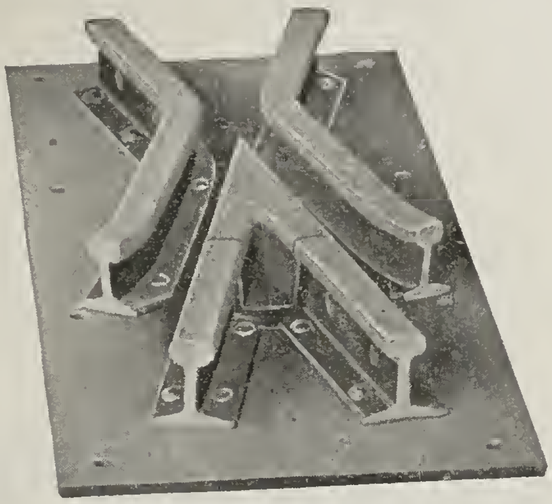
[CONTINUED ON PAGE 388.]



No. 108. Stiff Mud Flat Car. Steel Deck.



No. 114. Sand Lime Brick Car. Channel Frame.



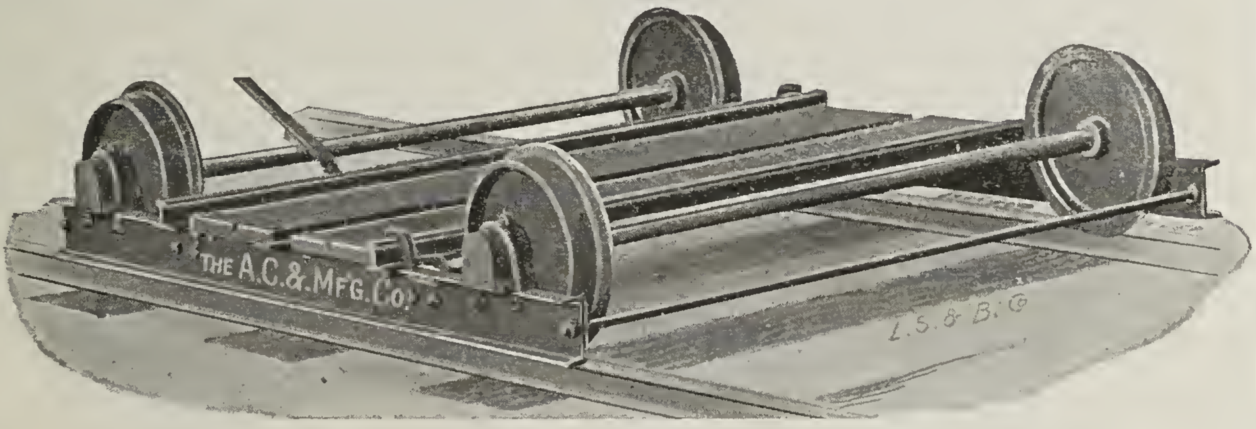
No. 1025. Steel Frog.

The Atlas Car & Mfg. Co.,

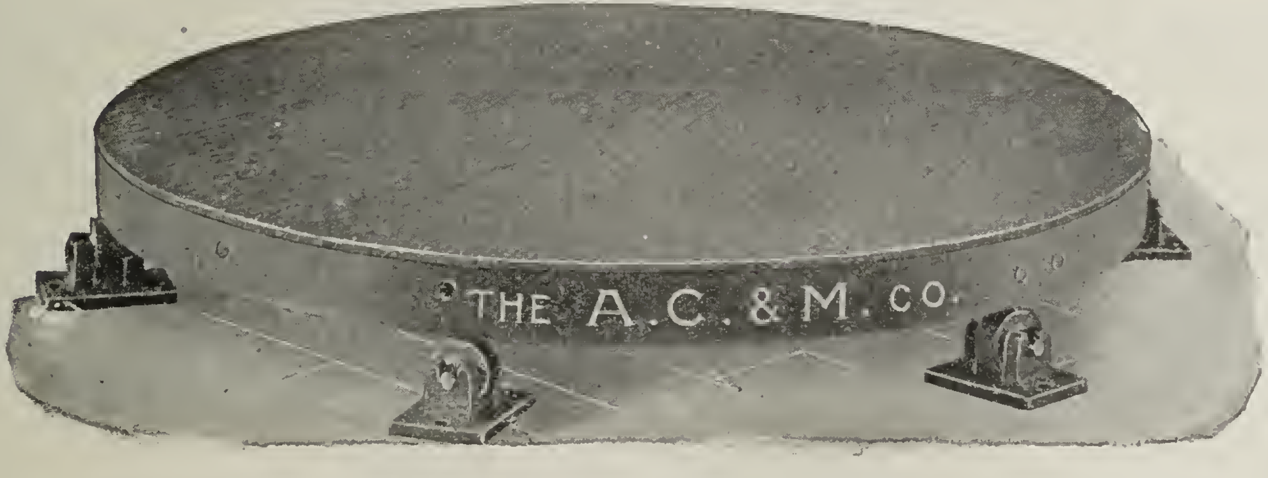
CLEVELAND, OHIO.

**Manufacturers of Steel Dryer Cars of all Descriptions and Equipments for Hot Air Dryers, including Rail, Frogs, Switches, Steel Ties, Portable Track, Etc
Also Transfer Cars, Turntables, Clay and Dump Cars.**

No. A. Flanged Pallet



No. 142. Transfer Car.



No. 147. Checkered Steel Top Turntable.

EDITORIAL NOTES AND CLIPPINGS—Continued.

an extensive scale, and no time will be lost in erecting their plant and preparing for the commencement of operations.

The Idaho Vitrified Brick Company, of Boise, Idaho, has filed a mortgage to secure bonds to the amount of $50,000.

Kent's brickyard, at Mobile, Ala., was badly damaged by fire recently. The flames are supposed to have been of incendiary origin.

J. J. Becker, Scott Bowen and Paul Labudde have formed a company at Garner, Iowa, to manufacture brick, tile and cement building block.

The Kenmare Hard Coal and Brick Company, Kenmare, N. D., is increasing the capacity of its plant very materially by building a large steam dryer and putting in an additional brick machine.

The Hyatt Brick Company is the name of a new concern organized to manufacture brick at Columbia, S. C. J. H. Rodger, formerly of Union, will have the management of the plant. They will make both brick and tile.

William Lenderoth, Staten Island, N. Y., for many years superintendent of the Kreischer Brick Company, Kreischerville, N. Y., died September 18 at his home in Staten Island. His wife, one son and a daughter survive him.

The Cary Brick Company of Mechanicsville, N. Y., gave a clambake at Newton Hook for the employes of their yards at Mechanicsville, Cohoes and Newton Hook. Including the families of the employes and other special guests, nearly 350 people enjoyed the festivities.

The National Brick Manufacturing and Construction Company, with headquarters at Omaha, Neb., has filed its articles of incorporation with the secretary of state. The capital stock is $750,000 and the stockholders are not individually responsible for its debts. The incorporators are E. H. Pumphrey, John Ellingsworth and A. J. Minick, and they expect to manufacture brick plants, sell territory and do a general mining business.

The New York Blower Company, Chicago, has issued another of their sectional catalogues. It shows their steel plate fans and some of their applications. The New York Blower Company is busy at this season of the year, especially with the installations of hot blast systems for schools, and drying propositions of various kinds keep shop and office in a hustle. Send for their steel plate catalogue No. 53 if you want an up-to-date publication on fans.

One of the largest financial deals that has been arranged by any Reading, Pa., corporation was consummated recently when a company was formed with a capital of $5,000,000 for the purchase of the brick patents of A. A. Gery, general manager of the Montello Brick Company. It is the purpose of the new company to lease from the Montello Brick Works all their plants in Western Pennsylvania and to enlarge their capacity by installing new machinery that comes under the patents of Mr. Gery.

The construction work on the new brick plant of the Stony Brook Brick and Slate Company, Stony Brook, Pa., is nearing completion, and the machinery is being installed, which consists of a four-mold Boyd special dry press, dry pan and complete equipment furnished by Chisholm, Boyd & White Company, of Chicago. The company has an abundance of a superior quality of shale which makes a high-grade press brick. Capt. J. W. Minnich is manager, and G. E. Goldner, a well-known and successful brickmaker, is superintendent.

Benjamin Franklin Reese, a prominent young business man of Pittsburg, Pa., died at his home in that city, October 3. He was a member of the Isaac Reese & Sons Brick Company, now incorporated with the Harbison-Walker Refractories Company. He had been ill for some time from paralysis, the result of a sunstroke two years ago. He leaves a wife and a large circle of friends. In commenting on his death, a local paper says: "In all his business dealings he was noted for his integrity and scrupulous attention to details. He was active in assisting those who needed sympathy and help."

Alex A. Scott and Alex McMillan, Knoxville, Tenn., with one or two other gentlemen, have organized three companies for the manufacture of brick of all kinds on an extensive scale. One plant will be located at Knoxville, Tenn., one at Washington, D. C., and one at some point in Virginia. Each one of the three companies which will operate these plants is to be capitalized at $50,000. Each plant will be of the most modern design, with all modern equipment, including the Scott patent brick cars. Each plant will have a large daily output, and will be under skilled management, Mr. Scott having general management over all three plants.

J. C. Adams has succeeded to the brick and tile manufacturing business of Adams & Wishard, in Wellman, Iowa.

Daniel Zehnder, contemplates building an additional kiln to his brick plant at Easton, Pa., in order to enable him to keep up with the demand for his brick.

The Superior China Clay Company, Chippewa Falls, Wis., offers some exceptional bargains for any one looking for a dryer, cars, filler presses, slip pumps, etc. See their ad. in the "Wanted, For Sale," etc., department.

The Peltier & Rayman Brick Company of Atkin, Minn., will make a number of improvements at their plant before another season opens, including the installation of new machinery and the building of a couple of kilns.

In a recent letter, renewing his subscription, C. L. Webster, Charles City, Iowa, says: "Your journal is the best of its kind I have ever seen. In fact, it is the best paper that comes to my table." Mr. Webster is scientific expert for the Interstate Investment and Development Company.

The Baltimore Vitrified Clay Company is planning extensive improvements for their plant at Westport, and when all are completed the plant will be one of the largest and best equipped in the country. They have just completed an immense machinery shed and have let a contract for the erection of a large ten-tunnel dryer. They also expect to build eight additional kilns.

In sending in his subscription to The Clay-Worker, C. W. Payne, Roodhouse, Ill., says: "While at the Fair recently I made the acquaintance of your editor and secured a copy of The Clay-Worker. After looking it over carefully, we have concluded that it is the best medium in the field for keeping informed on matters of interest to clayworkers and in touch with clay people, and so want you to add us to your subscription list."

The Standard Vitrified Brick Company is a new paving brick concern recently organized in Coffeyville, Kan., with $70,000 capital stock. The company has purchased the old Stark brick plant, together with twenty-one acres of the best shale land in that vicinity. J. A. Johnson, C. E. Woobbury, Huston Weyeth, L. C. Hamilton and D. E. Marshall, of St. Joseph, Mo., and W. H. Shepard, J. T. Wettack, Daniel Wells, Daniel Cahill, O. Kentner, G. H. Park and Thompson Black, of Coffeyville, are interested. The company will make paving, building and sidewalk brick. Fifty men will be employed.

J. C. Steele and Sons, manufacturers of the "New South" brickmaking machinery and labor-saving appliances, Statesville, N. C., report they have been very busy the past season, having run on full time and being behind on orders for a good part of the time. They are continually improving their line, bringing it up to the highest standard. They are now building their machines on steel foundations. They have just completed a large brick machine which they call "No. 5," and this is as large as any auger brick machine built in this country. It is built on steel foundations, with self-contained outer bearing and steel gears.

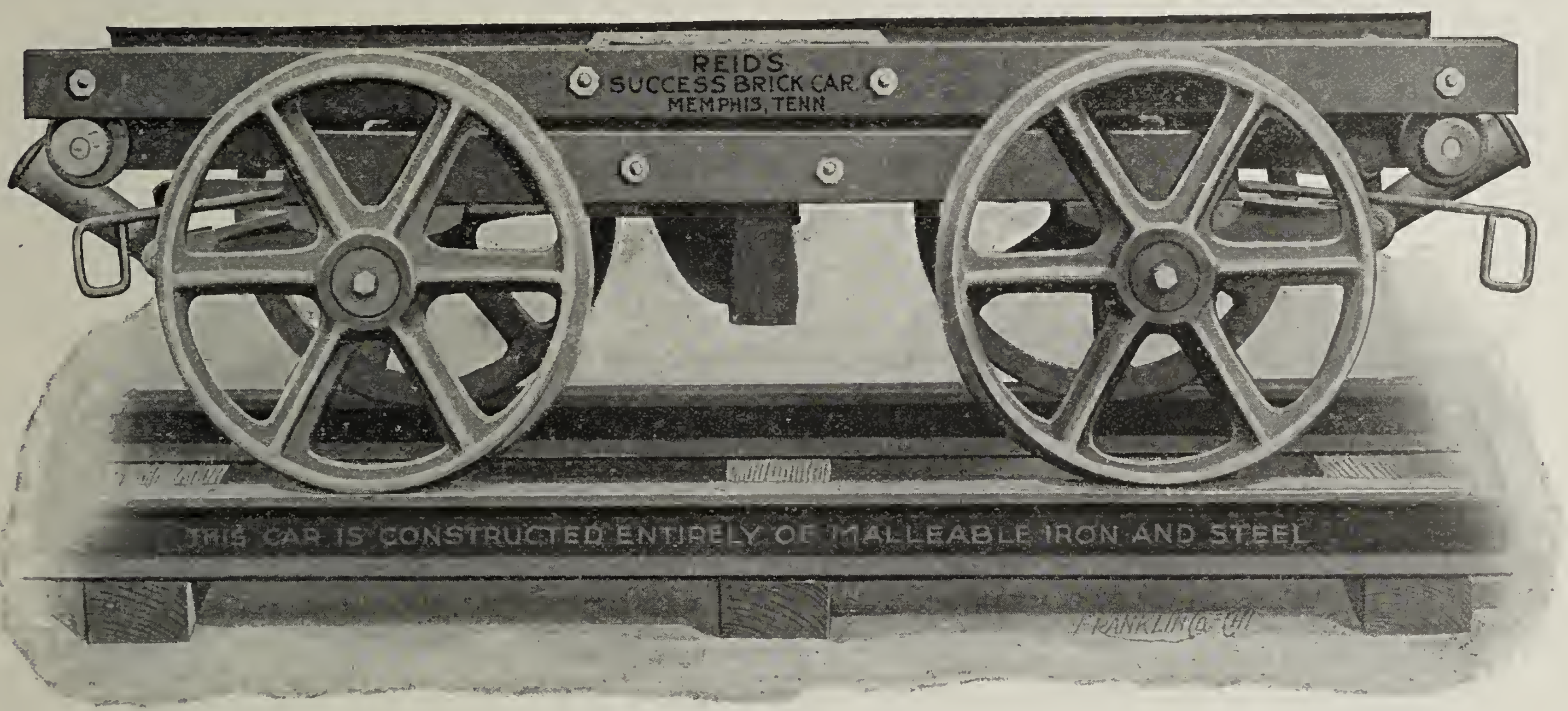
These Quarrelsome Fellows Are At It Again.

—Fort Wayne News.

Consider Now Reid's Success Brick Cars.

A ***perfect Car in principle, design*** and ***material.*** Constructed ***entirely*** of ***malleable*** iron and ***steel,*** not one ounce of common cast iron in the Car, the ***only all malleable*** iron and ***steel*** Car in the world. Practically ***unbreakable.*** Load can be raised or lowered from either end of the Car, ***dispensing*** with the necessity of ***cumbersome*** turntables on ***transfer*** cars. Upper deck can be raised from 19 inches to 23 inches, as occasion may require, just twice the lift of other cars.

We ***guarantee*** when Cars and System of drying are installed as per our plans that one man can successfully handle 40,000 brick from machine to drying sheds with much less labor than by any other method in use.


REIDS
SUCCESS BRICK CAR.
MEMPHIS, TENN.
THIS CAR IS CONSTRUCTED ENTIRELY OF MALLEABLE IRON AND STEEL
FRANKLIN CO. CHI

Our SUCCESS Transfer Cars, and all ***malleable*** iron and ***steel*** Turntables, with steel rack attached, are as good as mechanical skill and money can produce. Transfers constructed standard guage and height. Will furnish ***REID'S SUCCESS CARS and SYSTEM*** to responsible parties anywhere in the world, ***on approval.*** If not found ***exactly*** as represented, may be returned, Success paying freight both ways.

Write for booklet "Successes of SUCCESS," prices, terms, etc.

Designers and builders of ***complete*** brick plants of ***any capacity*** desired.

Success Brick Machinery Company

Corner Georgia and Tennessee Streets,
MEMPHIS, TENN.
CABLE ADDRESS: "SUCCESS, MEMPHIS, TENN., U. S. A."

See our ad. Page 421.

Written for The Clay-Worker.

AMONG THE POTTERS.

TRADE WITH THE pottery people in this city and vicinity has improved somewhat during the last thirty days, and the majority of the plants are quite busy. This is the time of year that the holiday goods are being ordered, and the majority of the potteries are getting their share of this business. A good holiday trade is looked for by the potteries, also a good year during the year 1905.

The Harker Pottery Company of this city has just completed the new addition to their pottery here, mention of which was made in a former number, and are now using their new decorating kilns with much success. The new additions are being occupied as warehouses, decorating and shipping departments.

The Knowles, Taylor and Knowles Company has had nearly all of their plants shut down for some time. They have had an immense stock on hands and their warehouses would not hold more. This is now moving and the potteries will start up in full shortly.

There is some talk of The East End China Company dropping the pottery busines and turning their plant into the manufacture of vitrified porcelain for electrical purposes. They have not as yet decided fully.

The Homer Laughlin China Company is making some repairs to their decorating kilns.

The Potters Co-operative Company are putting in a new Filter Press at their Dresden Pottery Works which will facilitate matters in their slip house greatly.

Patterson Bros., who have the yellow-ware pottery at Wellsville, Ohio, are about to erect an additional kiln which will make their capacity four kilns. They report business as being in very good shape.

Work has been started on the new pottery to be built at Huntington, W. Va. The plant will have a capacity of seven kilns and will be one of the most up-to-date plants in the country. The same company has closed a deal, whereby a plant of the same size will be erected at Parkersburg, W. Va. Mr. F. W. Fowler, president of the Union Potteries Company, and Mr. W. J. Harvey, are the promoters of the deal.

The C. W. Stine Pottery Company of White Cottage, Ohio, contemplates additions to their stoneware pottery there.

The Fulper Pottery Company of Flemington, N. J. is about to make extensive improvements to their plant there. Their clay, which has not been washed up to the present time, will all be washed in the future and a complete outfit for that purpose will be installed at once. The improvements will take about one month to complete.

The Locke Insulator Manufacturing Company of Victor, N. Y., is making extensive improvements to their plant in that city. They are installing new machinery which will soon be ready for operation, are putting up additional buildings and are about to erect several new buildings. The new addditions will hardly be completed before January 1.

The Marshalltown Pottery Company of Marshalltown, Iowa, is erecting additional kilns to their stoneware pottery in that city. The company is making other improvements to their pottery there, also.

The George C. Murphy Pottery Company, whose plant was destroyed at East Liverpool, Ohio, by fire some months ago, have filed suit against the Pennsylvania Railroad Company for $105,000.00 claimed to be due them for damage to their pottery, which was entirely destroyed. It is claimed that the plant could have been saved had the Railroad Company uncoupled the train that stood on a siding and kept the fire department from reaching that portion of the plant for twenty minutes.

It is thought that The K. B. Cecil Pottery Company of Cattlesburg, Kentucky, will not renew the lease they have on the pottery they are now operating there and which runs out the first of the year. It is said that they are now looking up another location.

The Buer Pottery and Mining Company has been incorporated at Dallas, Texas, and will build a pottery there immediately. The capital stock of the new Company is placed at $10,000.00.

Mr. W. J. Owen has taken active charge of the A. Radford Pottery Company, at Clarksburg, W. Va., and the plant is now in full operation. It is reported that they contemplate the erection of two or three additional kilns immediately. The plant now has only a capacity of two kilns.

The Pacific Pottery Company of Portland, Oregon, is about to install a complete new outfit in their pottery there. An entire new clay-washing outfit will be installed and the plant thoroughly overhauled, and practically a new pottery will be the result. The company has contemplated the change for a long time, but did not decide fully upon same until during the last week. The new additions will be in operation within the next two months.

It is said that parties from Crocksville, Ohio, are anxious to erect a pottery at Zanesville, Ohio, and it is possible that the deal may yet go through with. Several sites have been considered, so it is said, although nothing really definite has been done as yet.

The new works of The Lima Insulator Company of Lima, N. Y., have been almost completed and are nearly ready for operation. The kilns are all that are now required to complete the plant and these will be finished within the next week, when the plant will be started up in full. The Company is just a new one, the majority of the people having formerly been with The Locke Insulator Manufacturing Company of Victor, N. Y. Mr. W. D. Newton is president of the company and M. W. Burke treasurer.

The works of The Zanesville Filter and Pottery Company will shortly be moved from its present quarters and will occupy a new site where an entirely new plant will be erected. W. M. Shinnick, secretary and treasurer of The Mosaic Tile Company, and W. M. Bateman, vice-president of same, have become large stockholders in the company.

The Mosaic Tile Company of Zanesville, Ohio, now have in complete operation their new additions to their plant in that city which have just been completed. The company will manufacture glazed tiling as well as the mosaic, and expect a good trade on this line of goods.

The Clay Products Company of Vineyard Haven, Mass., is making some extensive improvements to its plant there and is installing some new machinery. The company makes a fine line of art ware and faience.

The name of the Novelty Pottery Company of Crooksville, Ohio, has been changed to the Crooksville Pottery Company.

Zanesville, Ohio, October 10, 1904. Tom Potter.

ITS EFFECTS.

Visitor—"What's the matter with this one?"

Attendant—"Poor fellow! He's been reading the war news and trying to pronounce the names." —Judge.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XLII. INDIANAPOLIS, IND., NOVEMBER, 1904. No. 5.

Written for THE CLAY-WORKER.

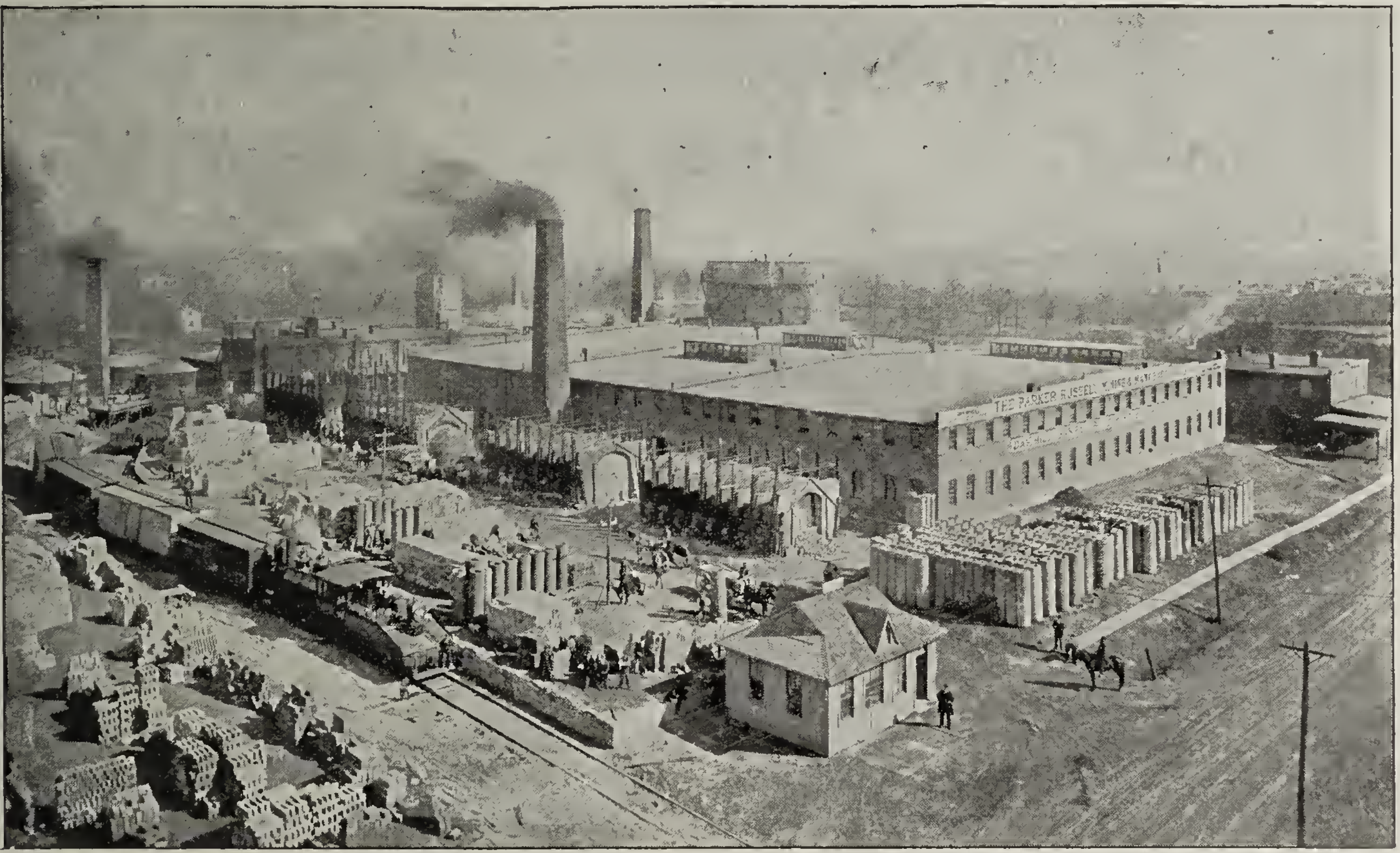
A GREAT FIRE CLAY PLANT.

Methods of Manufacture and Products of the Parker-Russell Mining and Manufacturing Company, St. Louis.

BY GEO. J. M. ASHBY.

IT WOULD SEEM as if descriptions of industrial plants of a similar character could only be of interest to people comparatively new to the work, and could not furnish anything novel to the man of long experience.

The fact is quite the contrary of this, and whoever, for many years has made it his principal occupation to examine the many branches of clay industries, study them carefully and describe them, will find in each one something of especial interest and more or less of novelty, no matter how old a craftsman he may be. This was impressed upon me to the fullest extent by a visit to the Parker-Russell Mining and Manufacturing Company's works at Morganford road and Parker avenue, St. Louis. I may say at once that the two distinguishing features which interested me most were the down-draft kilns worked on the continuous system, fired with producer gas, and the testing station for making continuous and exact tests of the refractoriness of the company's products.



The Parker-Russell Mining and Manufacturing Company's Plant, St. Louis, Mo.

The Parker-Russell Company possesses an enviable reputation as a manufacturer of fire brick and other refractory goods. The visit to the works explains the foundation of this good repute. The company was established in 1861 and incorporated in 1871, with Mr. Geo. W. Parker, president, Mr. T. G. Russell, treasurer and Mr. C. S. Russell, secretary. Of these three gentlemen only Mr. C. S. Russell is now living. The officers at present are: President, Mr. C. S. Russell, vice-president, Mr. D. R. Russell, and Mr. L. Parker, secretary and superintendent. Mr. S. B. Russell is consulting engineer. The paid up capital is $150,000.

Taking the Tower Grove avenue street car down town we get off at Morganford road and walk five or six blocks south, where the extensive works and the great array of gas retorts ready for shipment are very much in evidence, and could hardly be passed unnoticed either by day or night.

The lines of goods manufactured are gas retorts and settings, fire brick and blocks, blast furnace linings, Bessemer tuyeres and nozzles, fireproofing and partition blocks for buildings, glass house pot clay, silica brick and magnesite brick.

THE CLAY.

Beginning at the bottom, which in this case is 125 feet below the ground, the clay is nearly all got on the premises. None of it is from open workings or pits, but from three mines; one is 125 feet deep, the others 90 feet. About thirty men are employed in the mines, besides about 230 in the works. The clay is a high grade fireclay, of a gray color before burning and a buff to light brown after burning. In the absence of Mr. L. Parker on the occasion of my visit, I did not get the analysis, though I do not attach a very great importance to analyses anyway. An analysis of his clay may be a very useful thing for the man who is working it, to make or have made, but an analysis tells little or nothing to the reader. The physical analysis is, to my mind, of more value. How the goods behave in the kiln and in use is, after all, the main thing.

My visit to the plant was on a Saturday afternoon when the works were not running. Mr. Parker was unavoidably absent and I could not arrange to go at any other date, but Mr. Parker very kindly had his works' superintendent, Mr. William T. Johnson, stay to meet me, and that gentleman, still more kindly, declared that he not only did not object to spending his Saturday afternoon in the factory, but enjoyed it. It was very amiable on his part to say this. I certainly enjoyed it, for Mr. Johnson has spent all the wage-earning portion of his fifty-one years in the clay industries. His father was a brickmaker and owned a hand brick yard here in St. Louis. Notwithstanding this he is a progressive and up-to-date worker. He evidently enters with the right spirit and full determination into the improvements initiated by the general superintendent and secretary, Mr. Lemon Parker. Possessing, as I do, very decided opinions about the advisability, in most cases, of weathering clay, I was glad to find that a man of such long practical experience, combined with advanced ideas, was fully convinced of the value of weathering. The clay is thrown up in heaps and some of it remains as long as two years, to the great improvement of its working quality.

The working of the clay is done in a series of machines, first, where necessary, is the ordinary toggle-joint rock crusher, there are two of these in use; next comes the dry and wet pan. There are four 9-foot dry pans and two 6-foot wet pans. From the dry pans the product is elevated to screens in the usual way, the tailings come back to be reground. The finest dust is used for fire-brick mortar.

The clay is tempered in mud mixers, or horizontal pug mills, from these it goes to auger machines and, when required, it receives a further very severe working by being forced out under pressure. For fire brick the stream of clay is cut with the wire cutter and the brick are repressed in hand represses. There are ten of these latter machines, and, my recollection is, four auger machines and an equal number of pug mills. All the machinery, pans, etc., are made at the company's own shops in the works.

One of the Drying Floors.

Supt. Johnson Taking Seger Cones from Testing Kiln.

Looking Down on Mold Stands.

Large pieces of refractory ware, such as locomotive tile, and the various shapes of gas retorts and settings, which form a very important divison of the output, are molded by hand, as are also the high-grade fire brick.

DRYING.

The drying does not call for especial mention, this is done in the way that is common to sewer pipe plants, on floors with several miles of steam piping beneath. Here there are six drying floors, where a great variety of shapes are to be seen, as will be in the two main buildings. noted in an illustration given of one of these floors. These are

BURNING.

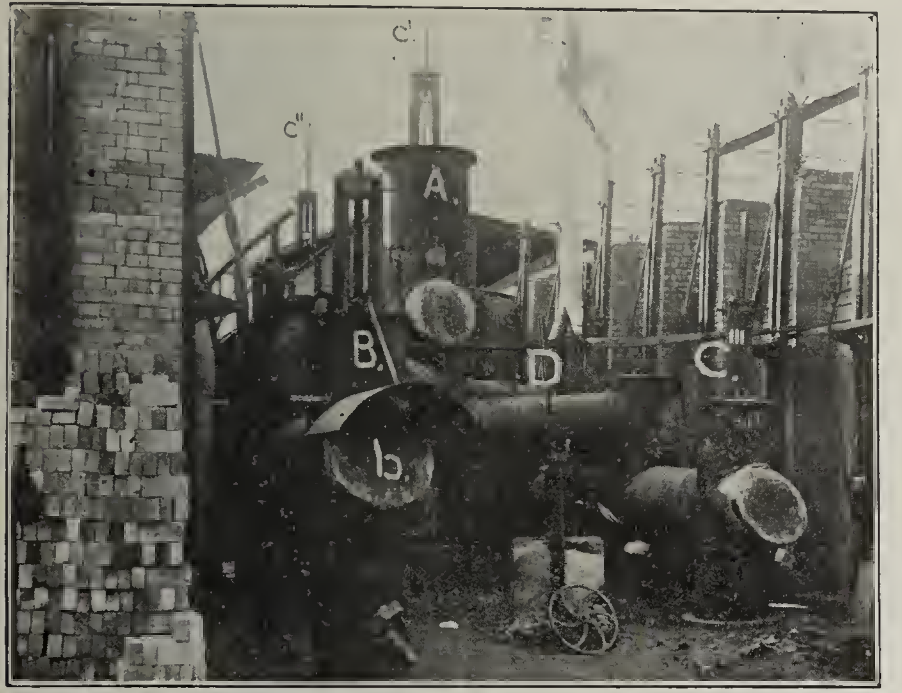
The *experimentum crucis* in clayworking may be said to be the burn. It certainly is of great, if not of greatest importance, while the kind of kiln may be of less importance, for good burns are obtained by skilled burners in very different kind of kilns, yet the kiln and the fuel and the handling of the kiln, are always a matter of great interest to the craftsman. There are twenty-six kilns in use here, twenty square and six round, down draft. The round kilns are 20 feet and 25 feet in diameter, three of each. Twenty-two of the kilns have furnaces with grate bars. Each of these furnaces have three doors, one above the other, the upper one for feeding fuel, the middle door, on a level with the grate, is for clinkering. The lower opening is to the ash pit.

PRODUCER GAS KILNS.

The four kilns that are not in the category with the other twenty-two are the interesting features. They are those already referred to as being worked on the continuous system and fired with producer gas. By being worked on the continuous system I mean that they are not simply running without interruption, but that the waste heat from the burning kiln is utilized for water smoking the green ware in the kiln ahead and heating it up to a certain point before lighting. The hot air in the cooling kiln behind the one burning is used as the air of combustion in the kiln under fire.

Producer gas is, of course, no novelty, but has been made for many years. I saw it in use quite forty years ago, and it has been applied for a number of purposes. Producer gas, or water gas, has been used for metallurgical purposes where heavy heats are required, and this with great success.

The gas here is made in two generators. One of these is indicated in the photograph by the letter H. It is surrounded by wood work, which conceal it to a great extent. It is built of iron, with an inverted saucer shaped top from the center of which rises a short, wide tube, with a cover and a valve arrangement by which coal can be fed in without loss of gas. The steam is supplied at the bottom; this is low pressure and goes into an open pipe, carrying air with it, after the manner of an injector. The production is continuous, not the same as in making water gas for illuminating, or gas engine purposes, where the steam passes over a highly incandescent fire until the fire becomes dull, when the steam is switched over to another fire, while the first one is brought to a glowing heat again. There are two of these generators side by side. In the photograph of the arrangements for distributing the gas the letters indicate as follows: A, the central receiver taking the gas from the producers. B is a receiver for supplying the kiln nearest to it. Three other similar receivers are connected with each of the other three kilns. C′ C″ and C‴ indicate the valves for shutting off the gas. C′ is on the main receiver and was put there in case it should be needed, but it is never used. Only those valves that control the supply of gas to each kiln are used. D is the stem of damper working in flue conducting waste heat from the cooling off to a water smoking kiln. E is a tube carrying air from a 7½-horse power fan. The underground flues are said to be about 3x4 feet in sectional area.



Producer Gas at Kilns.

The burning with producer gas has been in operation a little over a year and is giving full satisfaction. The quality of the burn is perfect. I inquired about the economy of producer gas as compared with ordinary coal. Mr. Johnson could not quote figures, but he said that the gas was certainly more economical than when firing in the ordinary way with the same kind of fuel as that from which the gas is made.

Gas Retort Drying Floor.

It would be very interesting to have the figures from exact tests. I am inclined to doubt that the gas heat would cost less than the direct fuel heat, though the burn would probably be a better one with the gas, and it would be worth using it even at a higher cost. I am not doubting in the least Mr. Johnson's statement that the burning is more economical than in the kilns where the ordinary furnaces are used, but I think that close investigation would show that the economy was rather the result of using the waste heat from the cooling-off kiln. We know that a properly constructed *and managed* continuous kiln shows a fuel economy of from 60 to 75 per cent. over the common kiln.

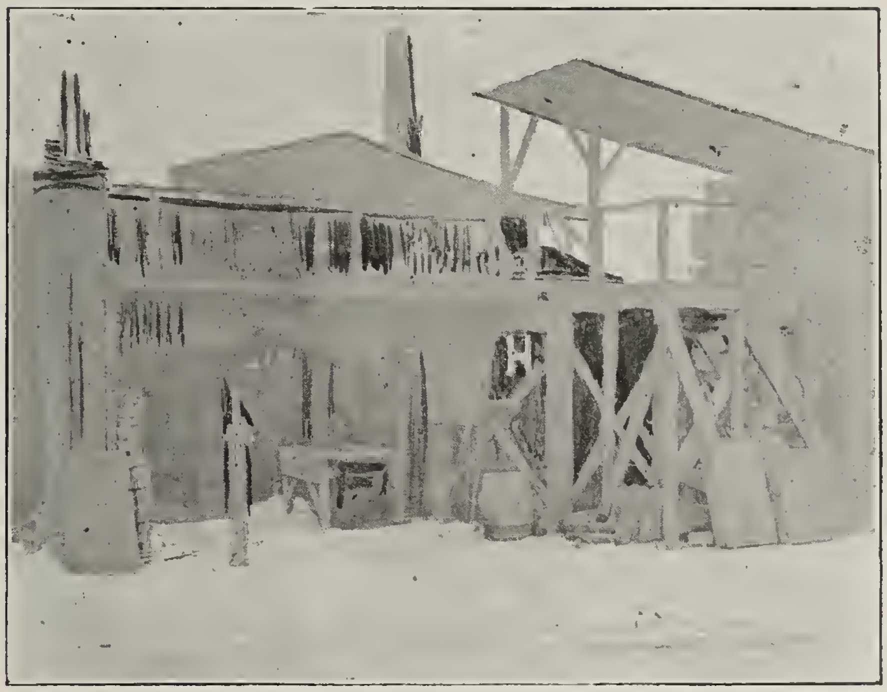
What surprised me was that these kilns burning with producer gas could be run on the continuous system with only four kilns, which is the equivalent of a continuous kiln with only four chambers. I think this gives evidence of very skillful management, though I expect that the addition of two, or four more would be a convenience.

In the other kilns the water smoking takes from three to four days, full fire from thirty-six to forty-eight hours, and the cooling off about three days.

The stacks for the twenty-six kilns are five in number and are 65 feet and 75 feet high. They are square stacks and the interior area is 4x4 feet all the way up.

GAS RETORTS AND GAS FURNACE SHAPES.

A very important part of the work here is the production of gas retorts. An illustration shows a number of these standing in the room where the molding is done; these are drying. It will be seen by the cloth on top of each that considerable watchfulness is exercised to ensure these great pieces drying equally. Another view shows between 150 and 200 of these gas retorts standing by the track ready for shipment. At a rough estimate I computed that there were from 800 to 1,000 of these retorts about the works, burned or in the green state, so that there must be a very large demand for them. A close examination of the pieces shows that they are carefully finished as well as perfectly burned. There must be a great quantity of gas made in different parts of the country, if we may judge by the great number of pieces, "shapes" on the drying floors and ready for shipment, which, in reply to a question, were stated to be for gas plants in various states of the Union. The great number of furnace bridges would also indicate an important business in this line.



Producer Gas Plant.

TRANSPORTATION FACILITIES.

The important question of transportation could not be much more complete. A switch from the Oak Hill branch of the Iron Mountain and the Missouri Pacific railroads passes through the center of the plant and gives direct connection with nearly every road in the country.

THE MACHINE SHOP.

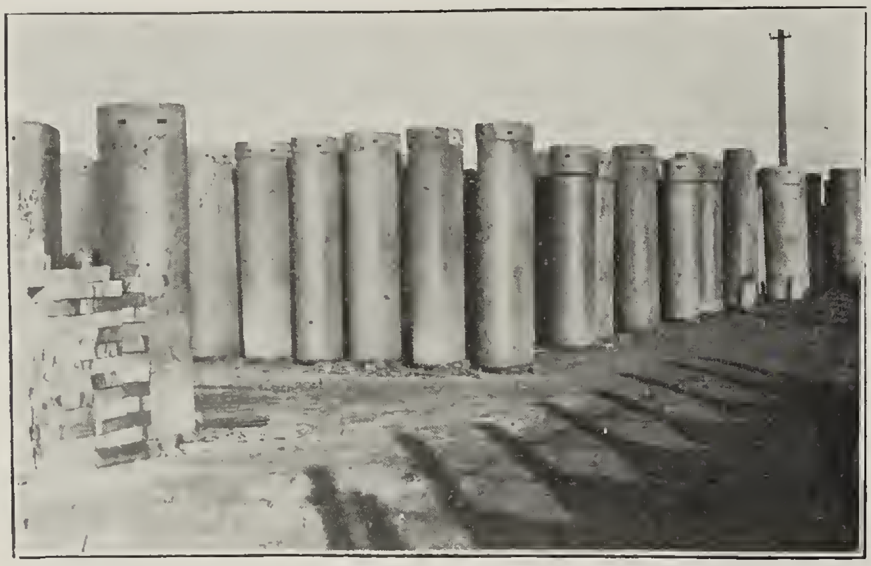
This is an adjunct to the works of sufficient importance to demand a reference, inasmuch as it is not only used for repairs, but all the machines of the plant are built in it. It contains two lathes, a small one and one with 18-inch gap, two planers, one a 6-foot, two drill presses, a bolt-cutter and other machine tools. Alongside is the blacksmith shop and near, the pattern shop, where various woodworking tools, lathe, band saw, etc., are found. The power plant consists of three prime motors, an Allis Corliss 150-horse power, a Brownell 40-horse power, and an old-fashioned slide-valve, 50-horse power. The boilers aggregate 300-horse power.

The fuel used for kilns, etc., is a good quality of Illinois bituminous coal, costing from $1.50 to $1.80 per ton.

THE TESTING STATION.

This subject seemed to me one of the most important things here. It is certainly one of the most novel. I have reserved it to the last, though I ought perhaps to have put it in the first place in case your readers do not reach the end of this article. The testing station, or testing room, I am not quite sure what is its correct title, is a brick building measuring about 40x50 feet, erected for this purpose. It is divided into two rooms, the main room contains the test kiln, the other, a smaller room, is for the draft fan, this is driven by an electric motor. There is no stack to the kiln.

The kiln is designed for very high temperatures. Its interior dimensions are about four feet by two feet and about four feet, six inches high. On each of the two sides are three fire holes for the oil burners. The fuel used is crude oil. The fan drives the air which forces in the oil, or sprays the oil into the kiln.


Gas Retorts Ready for Shipment.

The illustration shows the kiln open and empty. It had been used the day before my visit. Mr. Johnson is standing by the kiln, holding a tray of used Seger cones in his hand. These cones, I noticed, ran from Nos. 20 to 25 and all were more or less melted, while the refractory goods had stood up in the test.

TESTS.

These tests are made for checking up their own mixtures and determining the refractory point of brick of other manufacturers, and enable the superintendent to study the effect of fluxes, mixtures, density and size of grain in connection with analysis made in the laboratory department of the works. In any case it is an evidence of careful and scientific work that this testing is done, and in order to be still more positive, that rather expensive instrument, a LaChatelier pyrometer, was purchased about six months ago through S. Geijsbeek, of St. Louis, and used for exact determination not only of the temperature of the test kiln, but of the accuracy of the Seger cones, which, unless made with the greatest care, will vary in the results they indicate.

In reply to my question whether many of the pyrometer tubes had been broken during the six months' use, I was told that only one had been destroyed, and this by accident, a bricklayer fixing the bottom of the kiln hit the pyrometer tube with his hammer, and pyrometer tubes are not designed for such treatment.

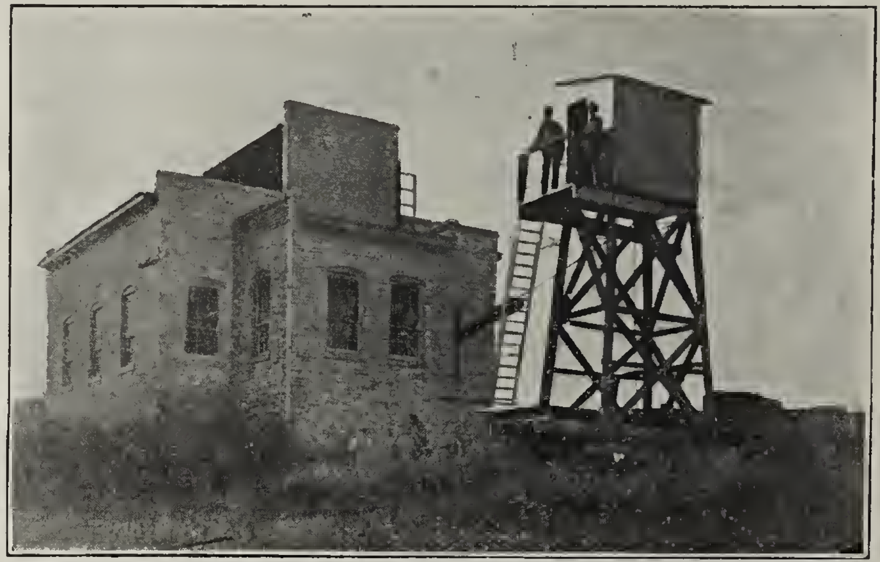
The view of the exterior of the testing house, taken from the rear, shows a scaffolding on the right. This is to hold the crude oil, which is fed to the burners by gravity; the spraying is done by air pressure from the fan. The burners are simple arrangements, a small central tube carries the crude oil, the central tube is within the air tube. The oil is heated before it reaches the burner.

THE EXHIBIT AT THE WORLD'S FAIR.

The Parker-Russell Mining and Manufacturing Company makes a fine showing at the Louisiana Purchase Exposition of its special manufactures of gas retorts, settings, fire brick, tile, blast furnace linings, fire proofing, etc. The endeavor has been made in the display to show the high quality of work, which requires skilled mechanics to perform. The company makes a specialty of intricate shapes, attempting to manufacture tile of any design, no matter how complicated. The ability to do this has been completely demonstrated in the display. The material used is, of course, of the very highest quality and, is especially adapted to gas and coke oven work. There is also material here adapted for steel furnace and glass pot construction.

I understand that this exhibit would have been much larger and more costly, were it not for the fact that the foundations necessary to carry on an elaborate and heavy line of goods on this site, the bed of an old lake, was impossible.

In the display a quartz from Missouri is shown, from which a very high grade of silica brick is made. There is also a quartzite material which is meeting with favor among coke men. Some of the company's trade is with concerns that require magnesite, which material is imported from Greece. These two latter lines while small, are growing in favor.


Testing Station.

ALUMINUM FROM CLAY.

An interesting exhibit for clayworkers is shown in Block 80, Mines and Metallurgy Building, by the Schwann Reduction Company, using the Schwahn process, patented February 3, 1903, No. 719,698, by which it is claimed aluminum can be produced for less than 10 cents per pound, or about one-half the cost of the electrical process used by others. This new process was extensively tested in a small plant in St. Louis. The same is operated now in a large plant at Belleville, Ill., fourteen miles east of St. Louis, in the near proximity of the coal and clay necessary for its operation. The exhibit is designed to show the various stages of the products from the clay with the end result of metallic aluminum, and for the purpose of interesting further capital in this enterprise. Instead of Bauxite, which is needed for the production of alumina, the raw material used for making aluminum by the electrical process, this company uses only the ordinary clay such a kaolinite (flint clay), of which the alumina is converted into sulphate of aluminum free of any impurities by an ingenious operation by means of acid. As an average, about 400 pounds of aluminum can be produced from one ton of such clay, and the reduction of sulphate of aluminum is simply carried out chemically by means of reducing gases in a closed retort heated from the outside in a furnace at a moderate temperature. A section of a retort with its contents, from a former operation, is to explain and to show the occurrences during the reduction of the sulphate into the metal.

Written for The Clay-Worker.

A PLEA FOR THE SMALL PLANT.

THE "COLONEL" MAKES SOME INTERESTING OBSERVATIONS ON THE SUBJECT.

"DO YOU KNOW," said the colonel, after we had looked over a lot of machinery at the Fair, that what has been impressing itself on me most strongly for some time is that we are losing sight of the main commercial point in regard to improved machinery in clayworking?"

"Well, no," I had to admit. "I don't believe I follow you exactly. I am well aware that there are two commercial points that make the clayworking machinery business worth while. One is to furnish machinery that will enable the clayworker to turn out his product either better or for less money, which amounts to the same thing, and the other applies to the commercial side of the brick machinery business itself. The machinery man is in the business to make money, but the modern machinery man fully realizes that for him to make money continously it is up to him to furnish a product that will help the man that buys it make money. I know we hear of over-enthusiastic salesmen sometimes who seem to regard it as their main purpose in life to sell machinery regardless of whether it will be a good investment for the purchaser, but, colonel, you surely do not intend to blame the industry as a whole for what these few who go astray do, for it is no greater fault than can be found in any industrial lines?"

"No, no, young man, you're getting clear off the track entirely. To set you straight, I want to tell you the first of all, that I have no kick whatever to make about the machinery men, nor how they push their business—it is a sort of oversight on the part of all of us that I have in mind. And, strange to say, I have arrived at the point in mind by a round-about way. You know, as I have told you before, that I have only a small brick plant in connection with my lumber yard, and it is from the small manufacturers' viewpoint that I am looking at this business. I come along here with you and we look at all the modern machinery for working clay, all kinds of it for all the different steps in the process from the clay bank to the finished product. Then I call to mind advertisements of the same machinery that appear in The Clay-Worker, and at times I get possessed of something that must be jealousy. I know that my business will not justify the use of such machinery, so I am envious of the fellows that have a big volume of business and can take a live interest in the new things offered in the machinery line. Nor am I the only one in my class, I am but voicing a natural feeling of the whole class that is varied considerably by personal characteristics, but is the same in the main. In fact, some are so affected by this feeling that they are spurred on into investing foolishly in modern machinery for a small place that has no more business than a parlor set has in a kitchen. It is this that I thought of first, this trying to equip a modern plant where the trade will not support the volume of business necessary to maintain such a plant. How many, I wonder, have lost sight of the main commercial point of profit and loss in this way while in pursuit of the modern mechanical idea.

"We know full well that if we can materially reduce the cost of an article like brick, we can, to a certain extent, stimulate trade, but there is a limit. Sometimes the limit to trade is made by freight rates, and sometimes by other conditions, but there is always a limit, and we should try and figure out this limit before spreading ourselves in the purchase of new machinery, for it is much better and easier to carry around a load of jealousy, knowing there are others with more modern machines, than it is to carry a load of machinery without the business to support it.

"But the point I am coming to is this: We are neglecting the small brick plant as a commercial factor, and therein I believe we are neglecting a very important commercial factor. We have machinery for small plants, it is true, but we have not made progress enough with it, and now what I would like to have you do is make a plea for the small plant. Stir up the machinery men to work their inventive genius overtime, if need be, to give us something startling in the way of machinery to reduce the cost of making brick in the small plants. I don't mean reduce it by a few fractions, either, but something startling, something that will cut the cost in half, and then you will get a demonstration of what I have in mind.

I am reminded in this connection of the great cry there has been for a small, low-priced process of making artificial ice. It has racked the brains of genius for twenty years, and is not entirely solved yet, but it is all worth while, and some day we will get what we are seeking, and that simply because the want has persistently cried out for it. This is no more of a crying want in the ice business, sir, than I can point out to you in the brick industry, only ours has not been crying. Just follow me a moment patiently, now, and I will try and make the point plain. We want to lower the cost of producing brick, not just a little, but a whole lot. Say, for example, that I could get machines by which I could furnish brick at such a price that it would be decidedly cheaper to build a house of brick than of lumber. It is easy to figure out what that would mean in my case. It would mean decidedly more brick, but not enough to justify the large capacity that is essential in a plant to-day to justify the use of modern machinery all the way through. Then consider the fact that the same thing that would happen to me would happen to several thousand other small manufacturers of brick, and you will get some idea of what it would mean in the brick business as a whole. And it wouldn't hurt any one but the lumberman, and the lumber industry is rapidly coming to the point where there will be plenty of use for the supply without building walls out of it. It wouldn't hurt the big brick man a little mite, for there would be no taking away of his customers—it would be a created demand, one that would help thousands and hurt none. In short, it is the main source open for forcing the use of brick in construction. In the cities where the big plants look for their trade, it is not so much a question of competition with lumber as it is hard and more expensive materials, and it is not so much a question of first cost as it is one of quality, etc. There's room for work on this idea, young man, and food for thought, plenty of it, and I just wish, sir, you would enter a plea for the small brick man and get the machinery clan to turn their inventive genius our way for awhile."

"A penny saved is a penny earned." One way for clayworkers to save is to sell discarded machinery and appliances, instead of allowing them to rust and decay in fence corners. Either house and preserve such machinery, or sell it to some one who can make good use of it. There are many such who can be reached through the "For Sale" columns of The Clay-Worker.

Written for THE CLAY-WORKER.

BRICK AND TILE MAKING IN OKLAHOMA.

THE MARVELOUS growth and progress of Oklahoma City, O. T., has developed some of the best local enterprises in the South, one of which is the American Brick and Tile Co., located two miles west of the city on the Rock Island system. This company, with a capital stock of $125,000, is three years old and has run continuously during this time, and makes one of the best dry-press bricks from pure red shale that is shipped out over the two territories.

Their shipping facilities are most excellent, having a railroad siding of their own, with a capacity of twelve cars, which enables them to receive fuel at the least possible cost and to load and ship their product at an expense far below the general minimum. The directors and stockholders are among the most progressive and enterprising business men of Oklahoma City, and they spare no expense for the best equipment and most modern method to make the plant not only a profitable enterprise to themselves, but a credit to the growing city in which it is located.

The plant is equipped with the latest improved four-mold Fernholtz brick machine and a nine-foot Frost dry pan. The shale bed is located in close proximity to the plant and the shale is handled by cable cars and hoisting drum at a depth at the present time of fifty feet. Four up-draft kilns have a capacity of 300,000 each.

E. D. Young, Superintendent.

As superintendent of their plant the company was fortunate some twenty months ago in securing the services of Mr. E. D. Young, who is an expert and experienced brickmaker, widely known throughout the South and West. Mr. Young, whose photograph appears herewith, has recently secured a patent for a new plan of setting brick in the arches, which equalizes the pressure and which absolutely prevents the breakage of brick so common in many kilns.

NOTABLE SKYSCRAPERS.

Every "now and then" New York erects the "highest office building in the world." There is now being erected at 60 Wall street, a 26-story building, this being equivalent to 352 feet 6 inches in height. The building is being erected by the International Banking Corporation. In this instance comparisons are interesting. The Masonic Temple in Chicago is 322 feet high and to the top of the observatory it is 352 feet. The Park Row building in New York is 325 feet and 6 inches high.—*Exchange.*

GIANT CRACKER AS A FIRE DETECTIVE.

Chief George W. Horton, of the Baltimore Fire Department, says the best fire alarms are giant fire crackers scattered liberally over the house, and to prove his theory he has placed the big "crackers" all over his own home.

Chief Horton says: "I have these crackers distributed all over my house, and have advised many persons to use them. The idea is decidedly practicable. One of the crackers is attached to a length of wire and it is then suspended from a place where it is likely to be useful. I have these crackers hanging from the ceiling of the cellar, from the ceiling of the stairways, from under the padded seats of the chairs and sofas—from every place where they can conveniently be put where they will not be too noticeable and where they are likely to be of some use.

Works of the American Brick and Tile Co., Oklahoma City.

"The idea is simply this: If a fire occurs it can't make much headway before it reaches one of the crackers, and the explosion gives the alarm. The idea came to me some years ago, and was suggested by a fire which occurred in a grocery store. The fire had gotten considerable headway, and it was discovered by the explosion of some canned goods, which attracted the attention of the people in the house. I decided that if canned vegetables were good fire detectives, crackers would be just as good.

Clay Pit of the American Brick and Tile Co.

"I have fixed up hundreds of these crackers for various persons, and I advise their use, especially in houses in the suburbs, where a fire is likely to get considerable headway before it is discovered."—*Baltimore Architect and Builders' Journal.*

Written for The Clay-Worker.

WITH THE IOWA CLAYWORKERS.

THE Mayo Brick and Tile Co., which was recently organized at Walhalla, N. Dak., with a capital stock of $100,000, has engaged S. C. Johnson, of Fort Dodge, Iowa, to superintend the construction of their new plant. The company has made a very thorough investigation of a hill of clay 350 feet thick, and the products that have gone through the tests denote a very fine deposit. The plant is located six miles from the Canadian line. The work has been started and will be pushed through to completion this winter.

The Fort Dodge, Iowa, Clay Works have been sold to J. M. Miller, of St. Joseph, Minn. The amount involved in the transaction was $60,000. The purchaser is a druggist, who will move his family to Fort Dodge and take personal charge of the plant. The plant of the Fort Dodge Clay Works was one of the largest in Iowa.

George E. Sargent and a company of men whose names have not been made public, have organized a company and will start a brick plant at Hampton, Iowa. The new brick will be made of cement and will be put on the market to compete with brick made from clay. The new firm expects to produce a brick of a quality very similar to the cement blocks now being sold on the market and extensively used. So far, their sales of the new brick have met with a ready demand. They claim for them that they are frost-proof and can be made in any color.

Mine Inspector Edward Sweeney, of Des Moines, has been in Fort Dodge inspecting the gypsum mines. His visit to the gypsum mines is of considerable importance, as it is made under the resolution of inquiry passed by the last General Assembly authorizing the mine inspectors and the labor commissioner to inspect the impracticability of applying to the gypsum mines the same laws that are in force with regard to coal mines. An effort was made in the last session of the Legislature to do this, but an amendment was carried to have the investigation made first and a report made upon it before taking any decided action in the matter.

Mr. David Roberts, a traveling salesman for the Plymouth Gypsum Company of Fort Dodge, Iowa, has been granted a patent for the United States on a plaster board to take the place of lath. Mr. Roberts claims his board is cheaper than lath, fireproof, moisture-proof and a non-conductor of sound. It is made in sheets three-quarters of an inch thick and a yard square. It can be sawed like a board to fit different dimensions. He has a patent pending in Canada, and when it is granted will make his arrangements for its manufacture. He has not decided the matter definitely, but expects to make it at one of the Fort Dodge mills

PLANT OF THE BOONE BRICK, TILE AND PAVING CO

The Boone Brick, Tile and Paving Company is a stock company, with the following officers: J. L. Stevens, president; T. L. Ashford, secretary; B. M. Huntley, treasurer and manager. The company was organized in 1901, built and equipped an extensive factory for the manufacture of brick and hollow ware. The factory is situated on the banks of the Des Moines river, two miles west of Boone, Iowa, where the company owns eighty acres of clay land. They began the manufacture of brick in 1902 and are now in their third successful season. The clay is taken from the side of the hill and hauled up an incline by hoisting engine and is dumped into shutes that feed directly into the dry pans. The equipment comprises three eighty-horse power boilers, Bates corliss 200-horse power engine, two Frost nine-foot dry pans, Freese special size brick machine with automatic cutting table, and two Richardson represses. The brick are loaded on double deck dryer cars and run into an eight-track steam dryer equipped by the National Dry Kiln Company of Indianapolis, Ind. They have ten round down-draft kilns with a capacity of 900,000 brick. The finished product from kilns to cars by wheelbarrow. They are now building and equipping a waste heat dryer. J. E. D.

General View of the Plant of the Boone Brick, Tile and Paving Co., Boone, Iowa.

JOKER HAS HIS DAY AT POULTRY SHOW.

Out at the big poultry show at the World's Fair recently the crowds swarmed through the buildings admiring the many specimens of fowl. City people were as plentiful as were the countrymen. In the turkey barn, near the English exhibit from Nevada, was a covered box, over which was thrown a curtain of cloth. Upon this was emblazoned in big black letters:

GENUINE IRISH BATS.

Nearly every one who passed through the shed exhibited enough curiosity to pull back the curtain for the purpose of closer inspection of this new feature of the poultry show from Ireland. A large crowd stood around the entrance and laughed loudly at the inquisitive ones. Contentedly reposing behind the fly were six ordinary bats—brickbats at that.—*Ex.*

Written for The Clay-Worker.

THE MODERN CLAYWORKER.—No. 14.

KILN TALK.

THE WRITER was recently on a yard where a considerable number of round kilns were being erected for the burning of paving brick. I found a professional kiln man was overseeing the job, and that the company was building a kiln of his patent design. Thinking an interview might be of interest to the readers of The Clay-Worker, I obtained a few general expressions which undoubtedly bear the earmarks of truth. When asked how he happened to be in the kiln business, and if he found it profitable, he replied:

"I am not prepared to say about the kiln business being profitable. So far it has been largely a labor of love, with very little thanks. I am inclined to think I might starve to death if I depended upon this business, because brick and tile men will probable always experiment and be satisfied to use some old idea that has been well enough in the past and with which some people have made successful burns of ware.

"The way I happened to get into the business is rather a long way. I am running a plant of my own. I am located where I can't get all the business I can do, and so have managed to establish a business of rather a diversified product, in order to have something to work on most of the time. I started in the business with what I thought to be ample capital, and where I supposed I had a good location. I have a good variety of clays. Well, I had more or less trouble from the start in getting even burns. I was using shale, and I thought it was all right for paving brick, because it was a shale. I know a good deal about that shale now that I didn't know when I started in. I got my information regarding it in the hardest and most expensive way. I found out that it was a hard burning proposition, and that's all I really did know about it. The trouble seemed to be in unevenness of burn. I had hard brick on top of the kiln and soft brick half way up from the floor, and I couldn't get the bottom without racking and twisting the top. I tried all manner and colors of burners, but the result was bad and then worse.

"Others were burning apparently the same shale with success. I looked for a different clay or shale, and found it in a light-burning shale or bastard fire clay. I have since found out that this shale contained a considerable quantity of carbon, and after heat was well past the watersmoke stage, things began to hum in my kiln. It burned to beat the band, without coal in the pockets, and I couldn't shut it off. Well, I didn't know but what I had struck it rich, but I found that I couldn't burn that clay without coal; in fact, when I did catch on how to burn it, I found that I used more coal than in burning my 'red' clay. The result was better, though. With this experience I determined to mix the clays. This did better, but still it was not the thing to make money with.

"Then I determined to set the one containing the carbon on the floor and the less refractory above it. This worked well, but it didn't suit me, on account of having to change the setting in the kiln so often. I determined that I needed an arrangement that would enable me to burn my carboniferous shale, or rather my shale containing carbon, by itself. I attempted the up-draft principle, but it proved disappointing. Then I tried several patented ideas and investigated them all, but none of them seemed to contain a principle that would answer for my special need, and so I went to work and got a kiln up myself and tried it on my plant. It worked fine, and I was able to use my shale that wanted to burn itself up whenever it got started, and make it do a good deal of the work of burning. Well, it so happened later that I had a poor condition of pit, from which I got my 'self-burning' shale, and I went back to my 'red' shale and thought I would have to put up with a poor burn or two until I could get things in shape in my carbon shale pit. The result was that I didn't go back to that pit for a good long time. I had struck a kiln that handled my other clay so well and gave me so much better ware that I did not feel like attempting to sell the product of my carbon pit against it. In the new kiln I saved time and got even burns, and figured that I was making better headway than by using the self-burning shale, which required some time to burn, even in my improved kiln. Well, I gradually drifted into offering my kiln to other parties and asking a royalty. Some of them took advantage of it, and don't seem to be sorry. I think the work of traveling around among the brickyards of the country is pleasant, so if I don't lose too much money I will probably stay in the kiln business for awhile."

As there are a good many kilns on the market, and many of them using the columns of the clay journals to advertise their merits in, I have left out a part of this interview, which dwells more particularly on the advantages of this special kiln. It is hard not to be convinced by letters of recommendation, and they seem to be a good thing in getting business of any sort. I have seen a good many letters of high praise for different things, and have followed them up to find no evidences of the contrivances on the yards from which the recommendations emanated.

Possibly these recommendations are given because of a desire one has to have company when they get in on the ground floor of a hard frost. The kiln man, as a character, is perhaps much abused, and I am free to admit that in some instances they are not abused when they are classed as dispensers of "blue sky."

One has to look at the kiln proposition in the same light as any other branch of the requirements of clayworking. That there are hundreds of kilns now in use which haven't one single point of excellence to recommend them, and that these same kilns are being copied daily, leads one to believe that there is room for the good kiln man to do good work. The one necessary thing is that the purchaser should know what is needed, and if he is not fully capable of supplying the want himself, with a certainty as to its working, there remains the alternative to call in the kiln man and see what he can show up. The kiln question is one that seems to fall behind in the solution of clayworking problems. We have to waste too much heat in the preservation of the fixed temperatures required under slow absorption by the ware to be burned.

Our present means are the generating of heat in a furnace and passing of same over the ware, absorption having to take place under rapid movement of the heat. Aside from matters of good construction, the economy of which does not seem to be fully understood, the first consideration is the means of controling the currents of heat so that they may be made to follow the course where the heat is needed. Heat attracting heat, it follows that a force or division of force must be used to solve the questions of such heat distribution. One essential of economical burning is a furnace which will burn cheap fuel, and yet to purchase such a one to get good results one needs a good kiln rather than an indifferent one attached to demonstrate the soundness of the investment. Many good furnaces are attached to kilns that have no merit whatever, and the result is not such as to please any one concerned. A little good judgment in the selection and combination of these points would soon tend to make the kiln man a welcome visitor, because he could not then remain in the business unless he had something that had merit and which could be used to advantage on any yard. There are a good many questions which come up in burning that could be easily solved by a kiln man. It isn't reasonable for the trade, who ask these questions, to expect the kiln man to do all his informing for the love of the business. If you want information, the best kind, on whatever subject, is the kind you have to pay for.

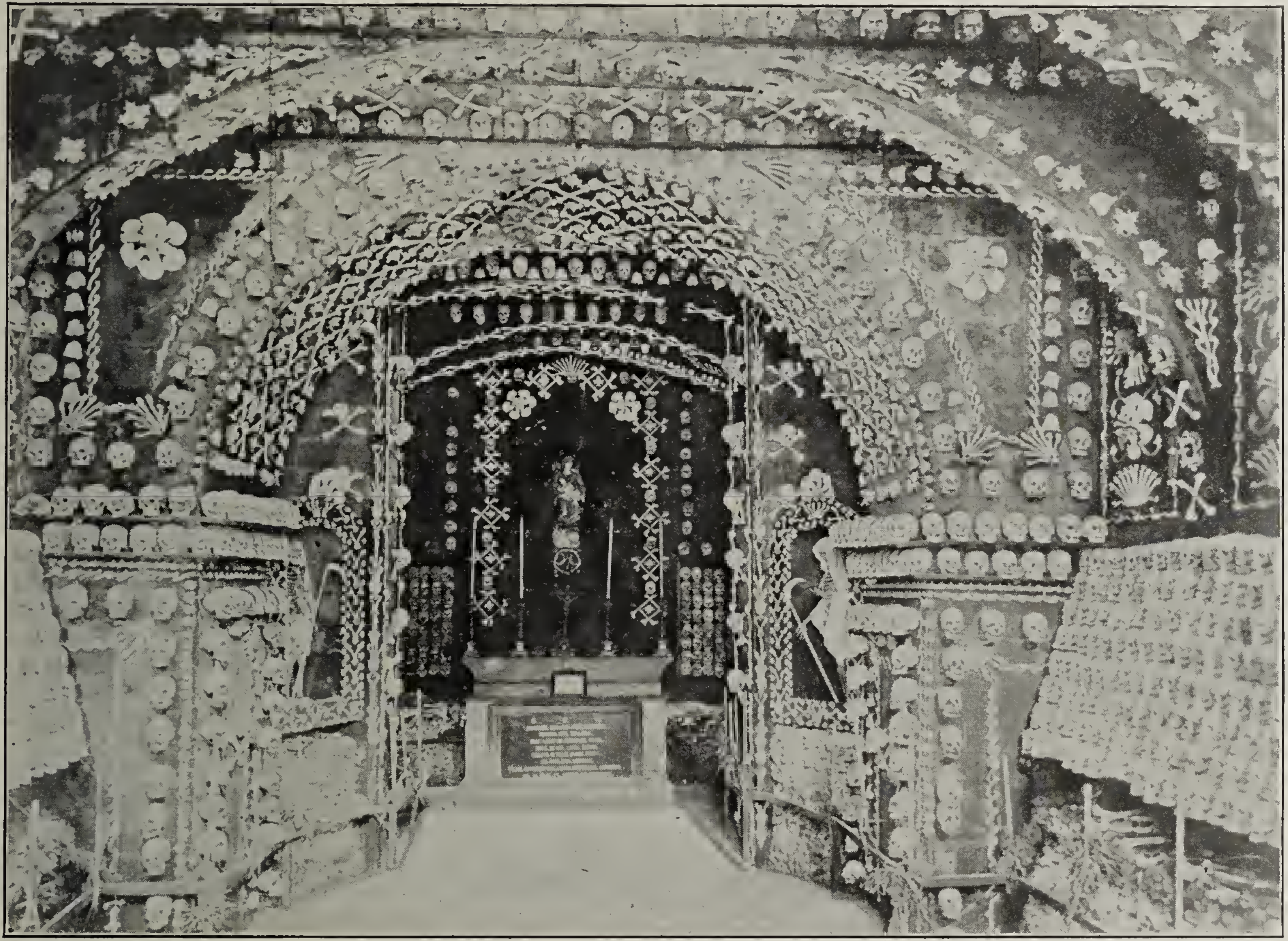
For cheap machinery the reader is referred to our "For Sale" columns. We do not advise the purchase of cheap machinery. As a rule, cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted," "For Sale," etc., columns a means of satisfying their needs.

Written for The Clay-Worker.

A BRICKMAKER ABROAD.

MALTA AND ATHENS.

AFTER SUCH VIGOROUS sightseeing all were glad for a day of quiet sailing on the blue waters of the Mediterranean between Algeirs and Malta. Arising early, we found ourselves within the sea wall of Valetta. Massive barracks encompass the bay, and again, as at Algeirs and Gibraltar, we were amazed at the walls. A train conveyed us from Valetta to Citta Vecchia, seven miles inland. It was a beautiful ride, giving us a view of the highly cultivated country. Malta was almost an island of stone, but rich soil was imported in early days from Africa and Sicily, which, being mixed with her limestone soil, produces wonderful crops. The little fields have stone fences and the small flat-roofed square boxes of houses show that there are not many acres in each farm. Flowers were in bloom everywhere. Malta must be the home of crimson clover, for it grew in rank profusion. You recall that this island was the scene of St. Paul's shipwreck, so vividly described in Acts, 27, 28.



The Chapel of Bones, Malta.

The first object of interest at Citta Vecchia is St. Paul's Church, built on the reputed site of the house of Publius, the Roman governor who entertained Paul for two months after his shipwreck. Underneath the church is St. Paul's Grotto, in the center of which stands a marble statue of St. Paul. A pick was given us, that we might dig some of the stone from the wall and carry away with us to drive away snakes. The priest in charge assured us that it mattered not how much was taken, as it was miraculously restored and never grew less. Near by were the catacombs. A trip was made through these subterranean passages, where had been the resting places of many great men and families. Nothing, however, remained but their empty sepulchers.

Returning to Valetta, a visit was made to the Church of St. John, said to be one of the finest in Europe. Its magnificence was overwhelming. The walls and arched ceilings were covered with Bible scenes painted by the old masters. We were told the inhabitants are made poor keeping up these handsome churches.

THE CHAPEL OF BONES.

This ghastly spectacle was the next object of interest. The skulls and bones of the many knights who lost their lives fighting against the Turks for the Christian religion are arranged in arches and odd designs on walls and ceiling. These sad relics, reminders of the heroism of these devoted martyrs, are fast falling into decay. We were only permitted to peer through a gate into this ghastly edifice, as six months before a part of the ceiling had fallen, and it was not deemed safe to enter. One cannot visit this island without a feeling of reverence for the devotion and gallantry of the Knights of the Red Cross, who fought to their death against the same foe that menaces the Christian religion to-day, yet the Powers stand off and raise not a hand to avenge the martyrs that are slaughtered by the Turks almost annually.

Malta was ceded to Great Britain in 1801. The event is recorded in an inscription in the Palace Square at Valetta. "The voice of Europe and the love of the Maltese confirm these islands to the great and invincible Britain." The Maltese language is Arabic. The women are brunettes and wear the paldette, a bonnet peculiar to the island. It is made of two yards of black silk gathered at one side and a whalebone or wire fixed so that it stands out and shades the face without hiding it. This bonnet is sensible and becoming, and worn by old and young.

There must be very little housekeeping to be done in the small, unpretentious country homes, but a woman was nowhere seen working in the fields, so we conclude that the manufacturers of the beautiful lace were hidden in those bare walls of houses. The passengers on our vessel were captivated with the shops where it was sold, and at last, when they were obliged to leave for the ship, it was found to be almost in possession of peddlers who had the very same articles for sale that were in the stores. The bargaining was as exciting as a country sale. At last the officers commanded them to leave, but still they hung on. In one instance a lady was about to close a bargain, and the officer, after a stern command, sprang toward the peddler, shouting: "If you don't go I'll kill you!" The man grabbed his laces, crammed them into his valise and rushed down the side of the ship. The lady ran after, but whether she secured her bargain or not I do not know. After our visit at Malta white silk lace collars were all the style on the "Grosser Kurfurst." Leaving the beautiful harbor, our captain sailed around to St. Paul's Bay, ten miles out of his way, to please the passengers.

Another restful day on the sea intervenes between Malta and Athens. With keen expectancy we watched the sun rise as we steamed into the harbor and landed at Piræus. The same haze and beautiful coloring appears that is seen in pictures, and the Acropolis shows dimly in the distance. This might well be called the battle-ground of nations. It was here the Greeks saved Europe from an Oriental dynasty and gave them law and liberty instead of ignorant despotism. No other nation has contributed so much to art and architecture. The Greeks have furnished models that have filled our museums and those of Europe. To them we are indebted for the most beautiful styles of architecture the world has ever known. What would our public speakers do without the mythology, science and philosophy of the Greeks for illustration?

The Temple of Zeus, Acropolis in the Distance.

A Woman of Malta in Her Paldette.

A Corner of the Famous Parthenon, Athens.

A ride of five miles across the Plain of Attica brought us to modern Athens, a city of 175,000 population. Athens seemed literally to be built of white marble, which is brought from Pentelicus. This mountain, whose summit appeared in the distance, was supposed to be covered with snow, but it was the quarries that shone white in the sunlight. These quarries have furnished building material for ages past, and will for ages to come.

The hotels of Athens are elegant, and the stores and business houses are such as seen in any of our own cities. But it was not modern Athens that held the most of interest, but it was her ancient temples and famous ruins that all desired to see.

The Temple of Theseus is nearest the city, and is in a better state of preservation than the others. Our first stop was at Mars Hill, and with a little help we reached its summit. Here it was that Paul preached his famous sermon. On the following Sabbath after our arrival Dr. John Potts, of Toronto, Canada, whom the Sunday-school world is so proud to claim, standing in the same place, preached from the same text chosen by Paul. He had for his congregation eight hundred followers of this same Jesus whom Paul preached, but not one "mocked" or called him a "baffler." A short distance from Mars Hill is the Acropolis. Here Grecian architecture reached perfection. The Parthenon was completed 434 B. C. In a struggle with the Mohammedan Turks, 1687 A. D., a bomb exploded and wrecked this "gem of the Periclean era." The ruins of the Erechtheum, Temples of Athena and Wingless Victory are here. Columns standing, columns fallen and lying as they fell, columns broken and lying in heaps—I felt I was in a cemetery, and indeed it was the graveyard of Greek mythology.

On the southeast slope of the Acropolis was the theater of Dionysius. Here are the marble chairs, with the names of the occupants that owned them 2,500 years ago. A little farther on is the Odeum, a music hall. Huge earthen jars stood among these ruins, and several ancient cisterns were between the theaters and the Acropolis. These columns and walls were not entirely of marble, but were filled in and built up with brick. We carefully secured a three-cornered specimen, that we might show the brickmakers of America, but after a visit to the ruins on the Nile and seeing brick that were 6,000 years old, interest was lost in our three-cornered specimen. The only ruin that had been restored was the Stadium. The seats were curved in plan, occupying rather more than a semi-circle, and rise one above another to the top. There is ample room to walk between them, and there is a promenade at top, center and at the foot. There are sixty tiers, and an aisle between each tier. Seats and flooring are all of white marble, and will accommodate 60,000 spectators. The magnitude and beauty were overwhelming. It was said by one it was being restored by a wealthy Greek; by another we were told it was a wealthy American who was having it done. At any rate it is the most magnificent amphitehater in the world to-day.

The King's Palace was also visited. Of course, his Majesty was not seen, but it was a great favor to see the apartments. At the first landing of the wide staircase was a remarkable picture of Prometheus Bound. The ballroom was very handsome, and the Queen's reception rooms were beautiful. The museum, art academy and schools of training were grand in architecture and appliances. Before leaving Athens I must mention the driver we had for two days. Whenever we stopped he was brushing his newly painted carriage or rubbing his horses. He patted their heads and kissed their noses again and again, saying, "Widdie, Widdie," and, do you know, I felt safe in that man's hands.

I must also tell of the funeral we saw that was so unlike any we had ever seen. The priests walked ahead, chanting; then came the banners and then the pallbearers, holding the coffin aloft so all could see. The lid was off and the corpse was exposed to view. It was the body of a woman, dressed in black, and there was a profusion of flowers. The mourners walked behind, and so they wended their way to the cemetery, not a vehicle in the procession. The same thing was seen in Jerusalem and Constantinople, so this must be the custom of burying their dead.

It was regretted that but three days were given to this most important city in history, but we were moving on scheduled time, and were due in Constantinople next evening.

(To be Continued.)

Written for The Clay-Worker.

THE ESSENTIALS OF INDUSTRIAL PEACE.*

IT HAS BEEN some years since I left my trade and began my work as a professional man, and yet I have kept in touch with the labor world ever since, and have been some sort of a student of industrial problems all my mature life. I am honored in being invited here to-day as the guest of the Builders' Exchange, and am grateful for the privilege of saying some words upon the question which is of increasing importance in the business world.

We are confronted by serious problems which have never before been solved. This, like the preceding eras, has its peculiar conditions out of which arise new and unknown difficulties.

Water Jar on the Acropolis, Athens.

Our so-called labor problem is the outgrowth of new conditions which have resulted from the combination of labor in great factories. The union of capital has given birth to great manufacturing plants where vast numbers of men and women are employed. The labor there is so divided that no one man's work is independent of the others. All are combined to produce the finished product. That means the end of the old-time mechanic working in his own house or little shop, and producing with his own hands the completed article. This combination of laborers into factories has changed the conditions of the whole labor question, and we are facing a new world, and we must not get scared or grow discouraged if we have some trouble in adjusting ourselves to this new, strange industrial world. We will get the tangled skein unraveled. We will finally get hold of the handle-end of things. But both employer and employed must keep sweet and patient, and be mutually helpful. Naturally each looks out for his own side and fears his rights will be invaded. But I feel sure that we are coming to a better understanding of each other.

I am convinced; in order that we may have industrial peace, instead of war, that there are certain fundamental principles which must be recognized on both sides.

There can never be a happy solution of these labor troubles until it is universally established that in this free country every man has a right to work for whom he pleases and at what wage he pleases. Compulsory membership in a trades-union in order to secure employment is un-American, and should not be tolerated.

The principle of the open shop should everywhere prevail. No man should be ejected because he belongs to some organization unapproved by the employer. No man has the right to inquire into all the personal relations a workman may sustain to his fellowmen. No workman has the right to dictate to the employer what other men he shall employ in his own shop. It is because this principle is so frequently violated that laboring men are arrayed against each other in such bitter warfare. It has come to pass that the worst enemy of the laboring man is the other laboring man. It is labor against labor, far more than capital against labor.

Mars Hill, Athens.

Wherever possible, the principle of compulsory arbitration should be recognized, and all differences between employer and employe be amicably arbitrated. I say, wherever possible, for I am aware in many cases the labor interests are not legally incorporated, and hence cannot be held to any such decision, while the representative of capital is in a position to be held responsible for the decision of the court of arbitration. This fact keeps many trades-unions from incorporation. They fear just this thing.

The principle of co-operation should prevail. Both capital and labor should be organized for mutual benefit. Labor should share with capital its proportion of profits, and also of losses.

Every laborer should be paid the wages he earns, and not the wage another man earns. Each should be paid according to his own worth, thus rewarding true merit and not putting a prize on laziness or incompetency, as is the case of a uniform wage scale.

Capital must recognize the right of labor to organize for its own protection and benefit, and such laborers should not be discriminated against so long as they do not interfere with the rights of others.

No man must be regarded as possessing the right to quit his job and hold it at the same time. If he refuses to work he has no right to prevent another man from taking up the task he has voluntarily laid down.

The whole principle of the boycott must be condemned. All effort to call in the aid of others, who have no personal grievance, to take up one's own trouble and join him in his efforts to destroy another's business, is both un-American and un-Christian.

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*An address delivered before the Builders' Exchange, of Cleveland, by the Rev. Charles Bayard Mitchell, October 24th, 1904.

All employes who have been taken on during a strike should be given permanent places, and not turned adrift as soon as settlement is made with those who threw up their work in the strike.

The basal principles of Christianity must be applied in all capital and labor relations, and both sides must obey the Christ's requirement: "Thou shalt love thy neighbor as thyself."

Written for The Clay-Worker.

THE RELATIVE VALUE OF FUELS.

THE VALUE OF FUEL is generally determined by comparative results in making determinations as to the adoption of one kind of fuel as against the other. Yet a good guide can be had by comparing the value of fuels in "B. T. U."—that is, British Thermal Units—which are the number of heat units a certain fuel will generate in its combustion. The established B. T. U. is the amount of heat required to heat one pound of water one degree Fahrenheit. Of course, it must be understood that the statements of the scientific world as to the value of fuels are all based on tests that have been carried out under the most auspicious conditions so as to insure the most favorable results. But as all fuels are tested under the same careful conditions, the stated results are on a par for comparison.

To the layman "wood is wood," but the heating value of wood depends upon its weight when dry and sound. It is here expressly stated "sound," because the writer has known of brick plants where wood had been seasoned so long that the "wood substance" had lost its calorific value through decay and dry rot.

It must be borne in mind that one pound of wood substance has the same heating value whether in light or heavy woods. Now, inasmuch as a cord of heavy wood weighs more than a cord of light wood, it follows that the differential heating values are of relative value as the weights are to each other.

TABLE OF WEIGHTS FOR WOOD PER CORD.

Kind of Wood.	*Weight.*	*Kind of Wood.*	*Weight.*
Hickory, shell-bark	4,470	Beech	3,125
Hickory, red-heart	3,700	Hard maple	3,975
White oak	3,850	Virginia pine	2,680
Red oak	3,250	Yellow pine	1,904
Spruce	2,325	White pine	1,860

By consulting the above table it will be seen that shell-bark hickory is 2 4-10 times the value of white pine, as 4,470 divided by 1,860 equals 2 4-10, or hard maple is 1 23-100 times the value of beech, as 3,975 divided by 3,125 equals 1 23-100.

The total heat contained in perfectly dry wood, or it can be said "wood substance," is 10,974 units. But the quantity of moisture contained in wood is not of one constant temperament.

Actual tests have shown the following results: Wood cut in the winter retained more than 40 per cent. of water at the end of the following summer. Wood still had from 15 per cent. to 20 per cent. of water after having been stored in a dry place for several years.

Wood which had been thoroughly dried absorbed 5 per cent. of water in the first three days and continued to absorb moisture until it contained from 14 to 16 per cent. as its normal standard. The above normal standard depending a good deal upon the hygrometric condition of the atmosphere.

Let us assume that we have to figure on a wood containing 25 per cent. moisture, then that would only really leave 75 per cent. of wood substance, or 75 per cent. of the 10,974 B. T. U., which would make only 8,230 B. T. U. But to convert the 25 per cent. moisture into vapor necessitates the use of 279 B. T. U., and we would only have available 8,230 minus 279 equals 7,951 B. T. U. Thus it can be seen that moisture in wood is detrimental in more ways than one.

As to coal, its heating value is based upon the percentage of hydro-carbon and fixed carbon it contains, modified by the percentage of ash and sometimes the sulphur it contains.

Coals from different localities have varying values; even coals from adjoining mines possess radically different values.

TABLE OF AMERICAN COALS.

	B. T. U.	*Ash.*
Big Muddy coal, Jackson Co., Ill.	11,781	6.59
Collinsville, Madison Co., Ill.	10,143	13.34
Mt. Olive, Macoupin Co., Ill.	11,763	6.84
Reinecks, St. Clair Co., Ill.	11,720	10.14
St. Clair, St. Clair Co., Ill.	9,261	21.83
Dumferline slack, Ill.	9,401	22.02
Youghioney, Pa.	12,936	5.00
Glen Mary, Scott Co., Tenn.	13,167	4.75
Hocking Valley, Ohio	13,414	2.72

By comparative calculations the values of coals can be readily obtained. Thus if Hocking Valley coal with its 13,414 B. T. U. costs $1.50 a ton, then Collinsville coal with its 10,143 B. T. U. would be worth only $1.13½ a ton. Or, if St. Clair County coal with its 9,261 B. T. U. costs $1.75 a ton, then Glen Mary, Scott County, Tennessee, coal with its 13,167 B. T. U. would be worth $2.49 a ton. The writer has burned brick cheaper with Hocking Valley coal at a higher price than he has done with Collinsville coal at a lower price, simply because the available B. T. U. were utilized and none of the produced heat allowed to go to waste. And bear in mind that what can be done by one burner can be done by another burner equally skilled.

The writer uses for comparison the rules adopted by the American Society of Mechanical Engineers as applied by them in making boiler tests, to-wit:

1 lb. of wood equals 0.4 lbs. of coal; or,

2½ lbs. of wood equal 1 lb. of coal.

Foreign authorities quote and use 2¼ lbs. of dry wood equal 1 lb. of good coal. Now by good coal is meant a coal having a heating value of about 14,000 B. T. U. For instance, if a cord of dry seasoned wood weighing 3,125 lbs. and costing $1.75 per cord, based upon the rule that 2½ lbs. of wood are equal to 1 lb. of coal, then coal at $2.80 a ton would be of equal value, or if we take coal costing $3.00 per ton, then the same wood would have to cost $1.87½ per cord for equal heating value. J. J. Koch.

CLAYWORKING INDUSTRIES OF FRANCE.

THE FOLLOWING has been received from Consul-General Skinner, who is at Marseilles:

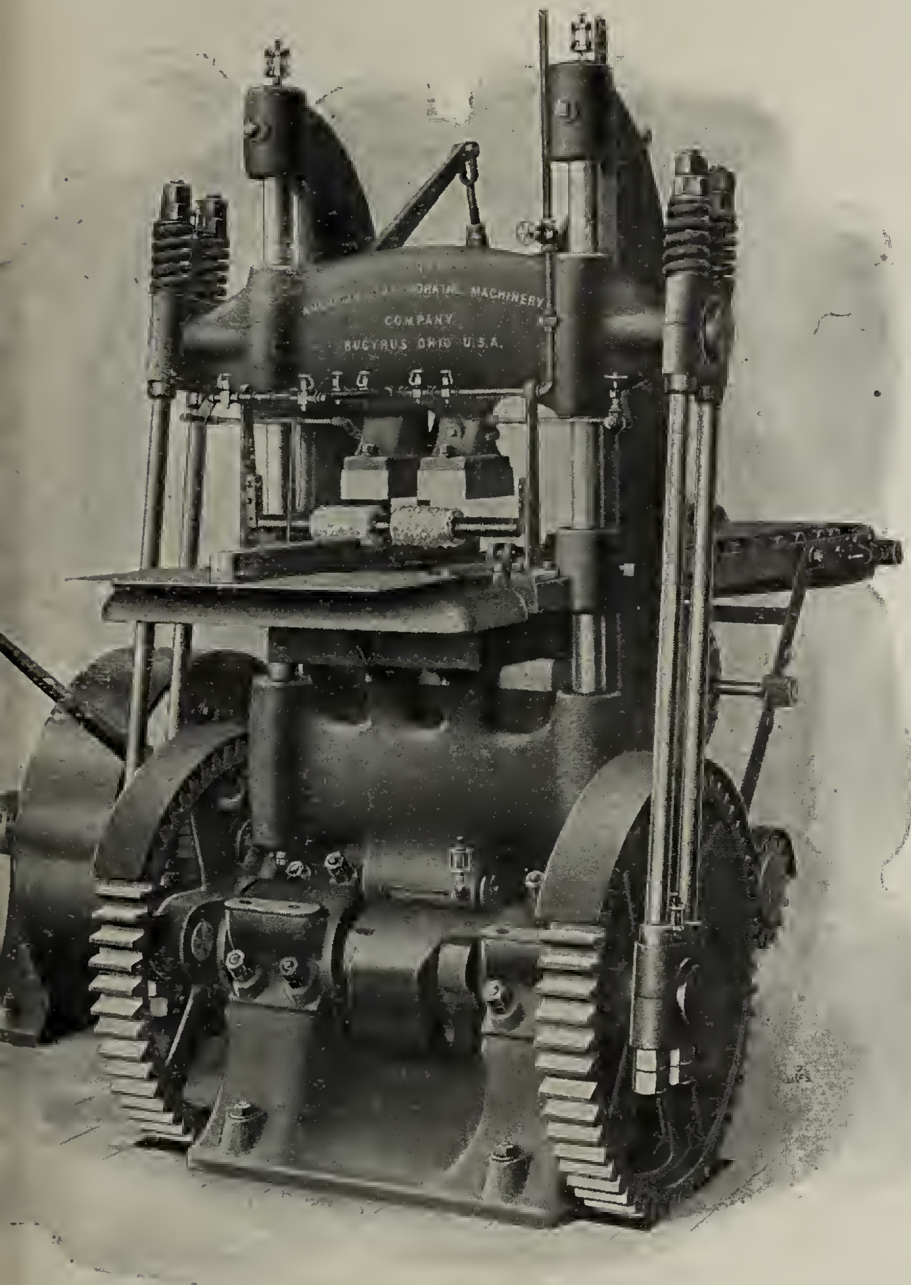
"The brick and tile industry of Marseilles is described by the Chamber of Commerce, in its last annual report, as one which represents the most important figure in the maritime business of the port of Marseilles, where it supports thousands of working men, representing a minimum of 15,000 inhabitants.

"The last available statistics show a total sale during twelve months of 303,230 tons, of which 156,927 tons were exported to foreign countries. There are a number of companies engaged in the business, but they are completely overshadowed by the Societe Generale des Tuileries de Marseille. This important corporation corresponds fairly well with the American conception of a trust, as it consists of twenty-one concerns, now organized under the general title above given, with works, the most of which are located at St. Henri, a suburban district of this city. Inasmuch as the Societe Generale is the most important factor in the industry, and manufactures a more extended line of wares than any of the others, I shall confine myself to facts obtained from a representative of this company.

"All of the local clay products are burned in kilns and they are executed in all sizes, and, in respect to tiles, in many different colors; only red brick, however, are manufactured. While common and pressed solid brick continue to be produced in Marseilles, they may be said to have disappeared, practically speaking, as a factor in local building operations. The present-day output of the Marseilles brick kiln is a block perforated lengthwise, which is said to be not only much lighter than the ordinary brick, but equally durable, strong and cheap, less expensive to ship and affording protection against humidity and heat and cold. It is claimed that the uniformity of hardness obtained in the manufacture of hollow brick provides more resistance to fracture than ordinary brick, and power to withstand steady pressure ten times greater than may ever be required for any purpose. They require less clay and fuel to produce, less mortar to lay and enable the bricklayer to accomplish more work in a given time. The demand for this building material for external walls is said to be growing considerably in foreign countries, as it is also in this. In France all partition walls are made of hollow brick, as are also the ceilings, upon which the plaster is spread without any lathing whatever."—*Exchange.*

NO. 42 DOUBLE MOULD REPRESS.

THE NO. 42 REPRESS is designed with a self-contained frame, which embraces many parts in one. Embodied in the frame are all journal bearings, which insures perfect alignment. The bearings are well proportioned, both in length and diameter. The two large heavy gears are provided with crank pins, which operate the upper cross-head by means of strong connecting rods on either side of the press. These rods are provided with heavy springs, which act as safeguards against breaking the press when improperly used. The lower cross-head is operated by means of a cam, mounted on a strong five-inch diameter forged steel shaft. The cam is faced with a steel shoe at the point where the greatest pressure is applied.



New Double Mould Repress.

This machine is so built that the pressure is simultaneous from both top and bottom, this advantageous feature being secured by means of the pressure feet being attached to the upper cross-head, while the lower pressure is attained by the cam attached to the main shaft. This double pressure, exerted from both top and bottom at the same time, adds materially to the quality of the brick by giving them a more uniform density. The lower pressure feet, after applying their pressure, continue upward until the brick are elevated to the level of the table, when an automatic device removes them to the offbearing belt, at the same time depositing new clots in the moulds, the cam being so designed that the clots or unpressed brick drop a short distance, then come to rest before they are dropped to the bottom of the mould. This arrangement prevents the brick from catching on the side or ends of the mould.

The mould-boxes are lined with a special high grade steel. They are planed and accurately fitted, and the liners when they become worn can be easily changed. A reliable and convenient oiling device keeps the oil supplied.

The cross-heads are broad, the metal being distributed in such form that it receives the lines of strain in the most advantageous manner. The guide bearings of the cross-heads are of extra length, giving long and broad bearing surfaces.

The design of this press embraces simplicity, solidity, strength, convenience of adjustment or renewal of parts and the well rounded curved lines which have a very pleasing effect to the eye.

The standard size press will repress a brick up to 3¾ inches thick, but it is so constructed that it can be arranged to repress a brick 4¾ inches thick when so ordered.

The friction clutch driving pulley is 36 inches in diameter, 8-inch face, and should make eighty revolutions per minute to repress 2,500 brick per hour. Height from floor to top of oil reservoir, 8 feet 10 inches; floor space required, 6 feet 6 inches by 10 feet; length of offbearing table, 6 feet. Power required, 5 horse. Weight, 7,500 pounds.

For further particulars write to the manufacturers, The American Clay-Working Machinery Company, Bucyrus, Ohio.

Written for The Clay-Worker.

KILN-DRAFT.

Where and When the Draft of a Kiln Needs Checking.

IT HAS COME under my observation repeatedly that when a kiln gets too much draft, the first and absolutely foolish and wrong steps are taken by bricking up the underground flues inside of the kiln. It is true that this will reduce the draft, but what good will it do? Not much. It will do more harm than good. Let me tell you that the place to cut off the draft on a down-draft kiln is not in the inside of the kiln, but the stack. When you choke up the underground flues you destroy the purpose for which they are intended, namely, to carry off, and as rapidly as possible, the moisture and blue vapor in the first and second stage of the burn. It is a proven fact that a brick, even when considered dry, contains about one ounce of water or mechanical moisture, added in tempering and not evaporated in the dryer.

Take a kiln of 100 M brick; we have to remove 100,000 ounces of water, or 6,250 pounds, or 781¼ gallons, of water, and the more draft we have the quicker it will disappear. The more sluggish the draft the longer that great quantity of moisture will hang around the brick or other clay ware, discolor it, forming a scum, and a heap of valuable time (which is money) is lost. You cannot have too much draft in any kiln, where the fireholes, bagwalls, flues and stack are built in reasonable proportion. We need plenty of draft in the first stage of the game in watersmoking. Who with common sense will then reduce the draft on a kiln when it is most needed? Who would stop up a part of a sewer at a time of a heavy rain, when the full capacity of the sewer is needed to carry off the water as rapidly as possible? Who would let the steam on a boiler go down to forty pounds when it takes one hundred pounds to run all the machinery at full capacity? Only an ignoramus. It shows just as much sense to choke the flues in a kiln, or to drop the damper during watersmoking, as covering the top of the stack with a sheet iron during heating up, to keep the heat in the kiln, or to cover up the chimney on a house to keep the heat in the stove. We do not only need plenty of draft, that is, unobstructed flues, in water-smoking, but we need it also in heating the clay ware to a red heat, during which period we have to expel the chemical moisture, the blue vapor and the product of combustion. Then, when all these vapors thin out and disappear, we can cut off the draft, if we have too much, by lowering the damper. It will do the work every time. But if you choke the flues before setting the ware, thinking the kiln has too much draft, then you cannot regulate the draft, you cannot increase it. If you should need more draft, and if you had a stack five miles high, it would not help you. Keep your flues in the kiln open, and you can regulate the draft at any time during the burning process at will; you can reduce the draft one-fifth, one-fourth, one-third, one half or three fourths with the means of a damper at the stack. There is the place to check the draft of your kiln, and not inside of the kiln in the flues. Do not imagine you can't control the heat; yes, you can, and you can do it to a nicety. The manipulation of the damper is a very important part of the art of burning. You can lower the damper so that you will not have enough draft, and you can lower it so that you will have too much. Not enough and too much—one is as bad as the other—and in some future article I will describe how the draft of a kiln is regulated with the means of a damper at the stack, and done correctly, just like a draft gauge would indicate to you. I am at present engaged in selling my experience at a nominal price, and later on I will give it free to those who cannot afford to give it. I believe in always telling the truth, but not all the truth. A Burner.

Written for The Clay-Worker.

SOME NEW YORK STREETS.

A DESCRIPTION of any of New York's streets will not be a description of brick, but, on the contrary, will indicate the need of brick. There is a well-grounded suspicion that New York is better built underground than it is above, applying this assertion to the streets only. Anyhow, more brick has been used underground, which is sufficient proof that it is better built.

But even though New York's streets are not brick, possibly that unnecessary slight could be overlooked, provided the material used was kept in repair. But it isn't. Whether the companies who lay the asphalt are beyond their limit of repairs, or whether they neglect the work because they are permitted to do it, the fact remains that repairs are not made, and when they are they last but a short time.

There are miles and miles of asphalt in New York that ought to be changed for some more substantial material. If some of the officials could have their way it would be changed. For instance, West Broadway, which carries perhaps one-fourth of all the wholesale trucking in the city, to say nothing of the immense proportion that passes across it to and from the railroad freight stations. The paving on a street carrying that amount of traffic, and heavy traffic, too, should be paved with something that would stand the strain. But asphalt is laid and relaid, only to be worn out in a few weeks, so that it looks like the illustrations of it as it stands while this is being written. The examples shown are indicative of the rest of the street. It is almost impassable, and yet nothing is done; at least, nothing that stays done. The asphalt repair corps appears occasionally, patches up the broken places, and passes on. Nothing permanent is ever done. It is simply a makeshift which is passed by the officials having the matter in charge, and the public takes the consequences.

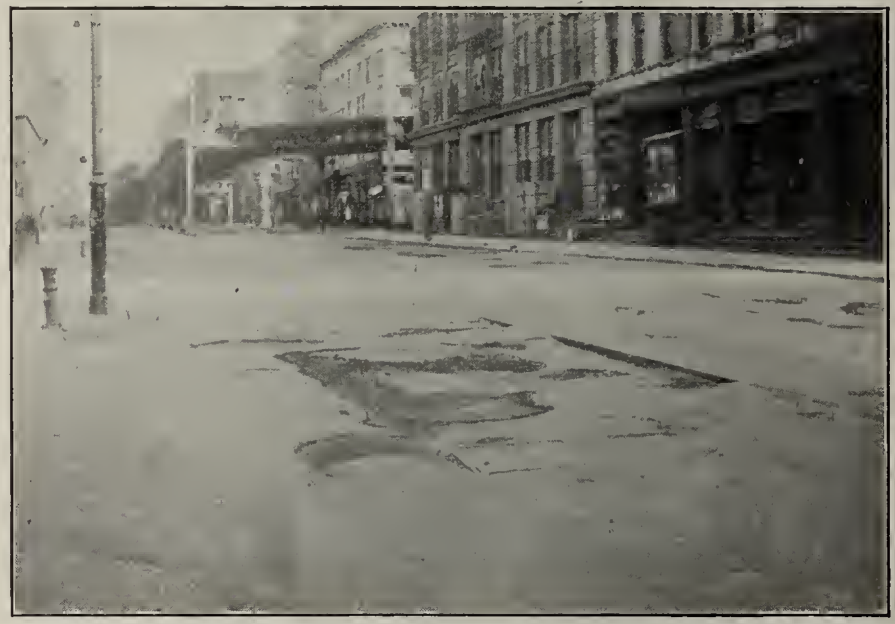
When the statement is made that West Broadway is impassable in certain blocks as this is written, the matter is not exaggerated. If a driver can safely pilot a heavily loaded truck along West Broadway as it looks now, he is certainly in his place. Loaded trucks are obliged to take the car tracks. They can't pass along the street safely unless they do.

Note the illustration showing the break in Park Place. Then see the one showing the succession of breaks just below Warren street. If they have anything worse out in the country, where the road tax is worked out, it would be difficult to find it.

In other words, it is not too much to say that asphalt has failed to maintain the traffic that it is called upon to bear upon such a street as that. Some brick experts say that brick wouldn't stand it. Belgian blocks are the only thing that will bear up under such a strain continuously.

The entire West Side in the vicinity where these views were made is devoted wholly to wholesale business. This necessitates a large proportion of heavy trucking. It is impossible to say how much there is along these streets. At the junction of Hudson street, West Broadway and Chambers street there are more vehicles pass in one minute or in five minutes than pass any other point in New York. The view of this point shows the two varieties of paving. Hudson street, which has very heavy trucking, is paved with blocks, yet when the streets are all merged in one and the traffic is, therefore, much heavier than it is on single streets, asphalt is used. Evidently some one has blundered. An illustration of Hudson street is given herewith, merely to show how well the blocks have stood the wear, even though they have been down going on ten years. There are evidences of wear, but they haven't broken up, and there is no danger of broken axles when driving over it.

It will be noted that an asphalt path runs along the left side, a concession to bicyclemen, who demanded that it be paved with asphalt when it was repaved. But the traffic was too heavy, and blocks were chosen instead. Hudson street connects with Seventh avenue, and from the junction to the limits of the city this path shows. It is a convenience that benefits but few now. But it does represent the common sense of the street-builders of those days. They refused to lay down anything that would soon be entirely used up.



Brick and Asphalt Pavement at West Broadway and Park Place. The Brick Show Little Wear.

Lately there has been a trial of the new preserved wood paving. The wood is cut into blocks about the size and shape of brick, treated with some preservative compound which renders them impervious to anything outside. They are then laid down like brick or paving stone, the cracks are filled with cement, and the street is finished.

For light traffic this makes an admirable street, since it is smooth and still—two important considerations. Its fault is that the blocks soon separate into a fibrous mass, and they are very slippery, even in summer. The top surface becomes oily, and horses find it very difficult to keep their feet. Again the authorities are making a mistake. There should never be such a pavement under such heavy traffic. It will not stand. It cannot stand. It is only a question of time when the life of the wood is gone, and it speedily falls to pieces.

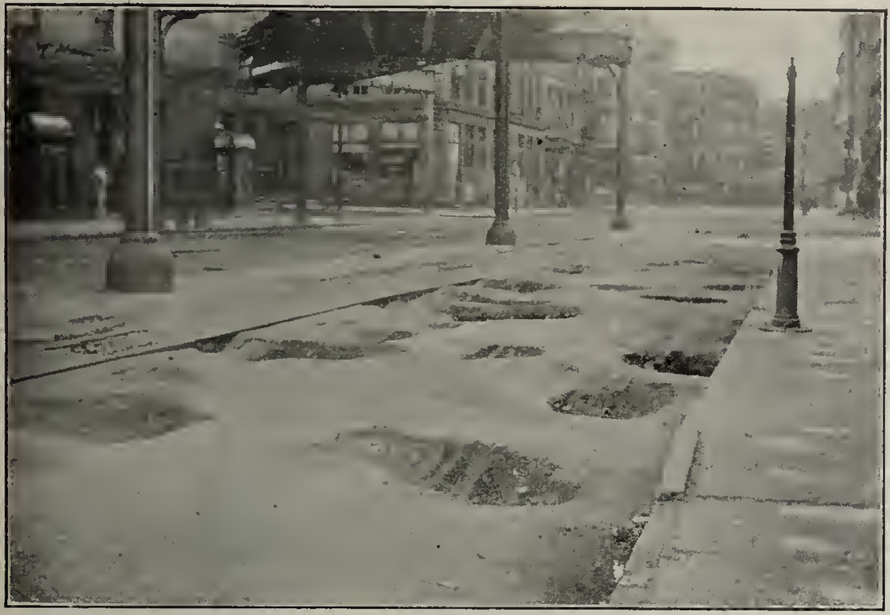
They are now paving Murray street, the next street below Warren, with the same material, taking up stone blocks which were passably good, to put down the other.

There is little more to be said at this time. The illustrations show the condition of the streets, and also the mixed mass of paving they have on the West Side. They really explain themselves, and need nothing more from me.
BURTON.

Written for THE CLAY-WORKER.

ASPHALT AND BRICK.

SO MUCH HAS BEEN written about this subject that it is hardly worth while to mention it again. It is a settled fact that hard brick are far superior to asphalt for reasons too numerous to mention. Of course, for driveways for light vehicles and promenades asphalt is very nice for a time, but for heavy traffic it is not worth a candle, compared with brick. If mistakes had not been made in selection of brick and properly laying them, asphalt would not have taken a hold on taxpayers as it did.


A Badly Worn Bit of Asphalt on West Broadway.

I met an asphalt-layer recently, and, as it was near noontime, I intended to have a talk with him. The tearing up of an asphalt street was going on. I asked the man what they were going to do with the asphalt covering being loaded in wagons. Says he: "This is hauled back to the asphalt plant, ground over and heated and mixed with a little more good asphalt; then it is replaced on the street, and this patching up has to be kept up, and when finished in one place, another place on the same street needs doctoring, and I tell you it is a hard job to dig a hole in the ground through asphalt, or to dig up enough to dig ditches for laying steam, water or gas pipe or electrical conduits, etc." He said he preferred brick. In answer to my question asking him the reason why, he smiled and finally burst into laughter, feeling as happy as a schoolboy close to vacation time. "Why, you can dig up the brick, after once started, just as easy as you can dig up potatoes. Asphalt you can't dig up so easy; it's painful, troublesome work cutting it with an ax sharp on both sides. Brick is the easiest pavement to repair of any."

Hudson Street, West Broadway and Chambers Street.—More Vehicles Pass This Point by Actual Count than Any Other Spot in New York.

HOW EASILY BRICK PAVEMENT IS REPAIRED.

In taking out the first row of brick, they must be broken on account of the cement's binding power, then if there is no trench to dig, the street only being repaired in uneven places, take out a few rows at a time, put sand on the foundation to bring brick up to a level, or rather a half of an inch above the regular surface of the brick pavement, then put plenty of sand on the top to be worked down from the weight of teams. My informant stated that he knew of instances where asphalt was taken up and replaced with brick. "If I had a team," he said (and he seemed to put extra weight to his utterance), "I would not drive it over aphalt streets, but would avoid them whenever possible, because they are too slick, especially in winter time. Why is asphalt more slippery than brick? For the simple reason that there are no joints as on a brick pavement, no foothold for horses on asphalt pavements, and when snow is on the asphalt and freezes, look out! "Well, the snow can be cleaned off on asphalt easier;" is a remark that nine out of ten people make, and my asphalt expert showed a broad smile on his face, extending from the corners of his mouth to near his ears. After amusing himself a few moments thus, he said: "Cleaning a brick pavement is easy, because the frozen snow breaks off at the joints of the brick; it is only frozen on the brick surface, while on asphalt it freezes all over, and it won't let loose. When snow falls on asphalt pavement it freezes on the whole surface, just like snow falling on a board (lumber), and you can't knock it loose; you must scrape it off a little at a time, while on brick pavement it can be cleaned off easy, on account of so many joints."

Preserved Wood Paving on Warren Street, New York City, Laid in November, 1903.

Now, why does snow freeze and remain so much more tenacious on asphalt than brick? This was a question my converted asphalt man answered quickly and satisfactorily. He said: "Asphalt absorbs moisture more readily than hard brick, and therefore snow does not freeze so hard to it, and even if it did, the many joints between the bricks make easy cleaning possible. This is not the only advantage of brick over asphalt, but the latter also cracks wide open sometimes in extremely cold weather.

"What about the behavior of asphalt in hot weather?" I inquired. "Let us walk two blocks north and I will show you how heat affects asphalt in summer. Do you see those impressions? They are prints from horseshoes in hot weather, when the asphalt gets soft and waxy." I remarked that it would make good plasters for pain in the side, and he said: "Hot bricks are better." So brick again takes the cake.
S. I. G.

LAND DRAINAGE

BY J. J. W. BILLINGSLEY

APHORISMS IN DRAINAGE.

THE EFFICIENCY of the drain depends upon the most careful laying of the tile. A good beginning in drainage is a sufficient and well-protected outlet.

Stagnant water under the surface of the soil needs removing, as well as that on top of the soil.

Buy the best tile—tile as near perfect in form as possible, and well burned.

Dig deep and lay the tile well.

Be diligent in drainage, and your work will tell.

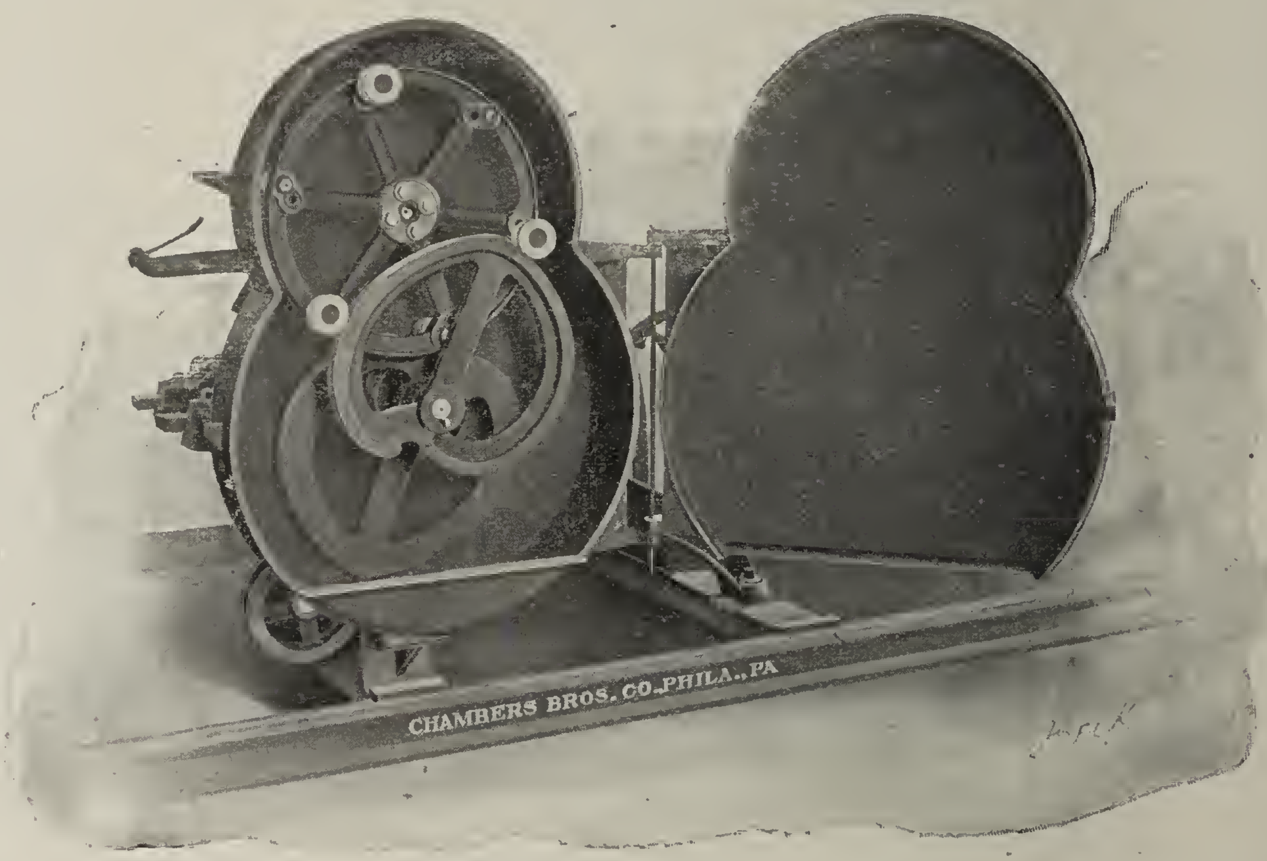
Drain the water out by the shortest route.

Get the stagnant water out of the soil by underdraining it, and you will have no trouble from the "heaving" of the soil.

To tile-drain means to be successful.

DRAINAGE INVESTIGATIONS.

In a late bulletin (No. 723) just issued from the Agricultural Department, treating of the effect of seepage water from irrigating canals, it is said; "In time it fills the subsoil in the lower levels, causing a gradual rise of the water plane until in places what were formerly productive fields become bogs and marshes, in which the roots of all vegetation is drowned out. As the soil water evaporates it becomes more and more concentrated, until the water and soil become so strongly alkaline as to check the growth of plants, or prevent it entirely, leaving the ground bare of vegetation, but covered with a crust of alkali. Seepage water, therefore, causes two injuries—it drowns out vegetation in some places by excess of water, and kills vegetation in other instances by excess of alkali. * * * To relieve these lands of their surplus water and alkali drainage is necessary." The bulletin further says: "The most extended studies of drainage of irrigated lands have been carried on in California, Washington and Utah. In the district about Fresno, Cal., where the water plane was once seventy feet below the surface, it has risen in some places to two feet from the surface. * * * As a result of two season's field studies, plans were made for two methods of drainage, one employing open ditches and the other drain tiles." The reports of the investigations during 1903 show the results of these studies and furnish plans for the relief of the lands now being damaged. The government experiments have been so satisfactory in the use of tile drainage to intercept and remove the excess of water resulting from seepage that it has opened up a somewhat new field for drain tile. In the experiments made it was difficult to get drain tile, and, since the experiments have proved so satisfactory, the demand for drain tile has increased. Some of the brick works located convenient to the arid lands now being irrigated will find it to their advantage to add a drain tile department to their works in the near future.



Back View Chambers Bros. Co.'s Automatic End Brick Cutter.

THE TWO FIELDS.

Two fields of equal size and alike soil conditions by nature, except one has been underdrained—there is only a dividing line between them. It is agreed by the two owners beforehand that they should serve to demonstrate the utility of underdrainage—both being sown to spring barley. The drained field was ready to plow and was sowed some ten days in advance of the field not underdrained.

The difference in time of seeding is no small item, when it adds a heavy per cent. to the yield. Both fields are harvested, and a committee of three experienced farmers appointed to measure, clean and weigh the grain from an average acre of each field. Their report showed 18½ bushels of light-weight barley per acre from the field not underdrained, and 51¼ bushels plump, standard-weight barley per acre from the drained field. This report settled the question of upland drainage in that section; and a like trial, taking almost any kind of farm products, will give like results.

COST AND PROFIT.

Let us make a few figures as to the cost of draining a twenty-acre field of low, wet, black land. For, after all, commercially, we do things upon the basis that it will pay, and we figure in advance to determine if the undertaking will pay. The land in its present condition affords only a little grass in the dryer part of the season. Not enough to pay the taxes. If it is drained this fall it will be ready for the plow next spring and can be planted with corn. An open ditch will be required to make an outlet for the drains. The open ditch can be put underground in a year or two by using large tile. The main and lateral drains will require as much as $200 worth of drain tile, and the digging of the ditches and laying of the tile will cost $200, which, added to the cost of the tile, will make $400, the drainage costing $20 per acre. Heavy clay soil would cost more if thoroughly tile-drained. This soil is open and requires fewer tile and less labor to do the work. The land will be in excellent condition in the spring, and ready for the plow a week or ten days in advance of higher land—land that is thought by many not to need underdraining. If well broken and planted to corn and cultivated in season, we may safely expect a yield of 70 bushels per acre. The cost of raising an ordinary crop of corn is about $8 per acre.

Our figures run about as follows: Yield for the 20 acres, 1,400 bushels, which will be worth 40 cents per bushel, or more, or $560. The cost of cultivation is $160, which, deducted from the $560, leaves a balance of $400, or the cost of underdraining the land realized in one year. It is true that these figures apply to wet, black soils, but there are hundreds of farmers who have done quite as well—in fact, some have realized larger profits.

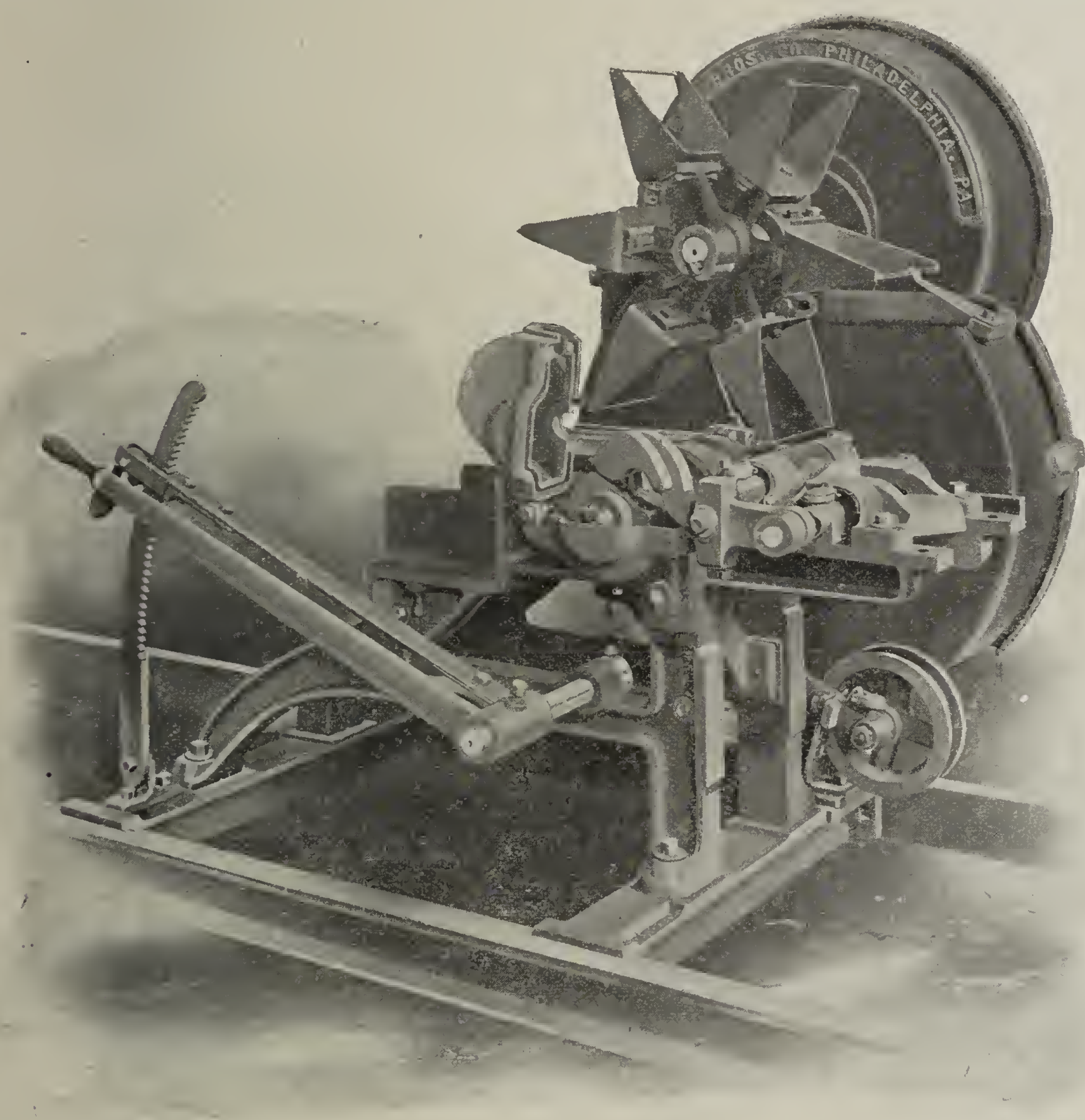
Heavy clay soils require more labor and a few more tile to do thorough work, but the added profit realized from the increased yield of products will return to the owner the cost of underdrainage in two or three years at most, and then the increased yield is an added gain each year in the years to come. The tendency of Western farmers is to spread the same sum of money over two or three times the area, and though it is even then a paying investment, the profits per acre are not so great. It is far better to confine our operation to smaller areas and do better work and reap quite as large returns.

A gentleman remarked to the writer, a short time ago, that if he had seen these things a few years ago, when he did a little draining, as he does now, he would have done a great deal more, and would have largely increased his profits in farming. So it is, where any work in drainage has been done worth speaking about, they regret that they did not do much more, and many are taking up the work again—not where they left off, but they are going back to where they began and are laying the foundation over again, far better and more thorough work. Ex-Governor Hoard said to the writer only a few days ago: "I have laid several miles of drain tile on my farm, and I am impressed with the idea that we have only commenced the work of underdraining. There is so much in it—in the removal of the excess of water, the better soil conditions, in the less labor required to cultivate the crops, in the increased yield of crops, in the greater profit of farming—that I do wonder sometimes why we do not do much more draining."

PULLED THROUGH.

S. E. Hagy, of Etna, Ohio, once said: "Ten years ago I did not know which would come out on top, my debts or myself. I borrowed money to tile drain my land. I have supported and educated a large family, have paid my debts, and have money to my credit in bank, and I attribute my success largely to the fact that I have underdrained my land. I had a yield of 80 bushels of corn to the acre the past season, notwithstanding the severity of the drouth." Big crops can be grown every year on rich and well-drained land. Big crops will pull almost anybody through.

CHAMBERS BROS. CO.'S IMPROVED NO. 8 AUTOMATIC END BRICK CUTTER.



Front View Chambers Bros. Co.'s Automatic End Brick Cutter.

THE ACCOMPANYING illustrations show front and back views of this new cutter, several of which have been placed in use during the present season, and which Messrs. Chambers Brothers Company intend to put on all their new end-cut machines next season. It is a further development of the cutter they have been making for several years. The essential feature of difference is that the tappet wheel has three lugs on each side, and these consist of steel pins on which run rollers. These rollers are bushed with a self-lubricating bushing and do not require any lubricating. They roll against the face of the cam, instead of sliding, as is the case with the old cutter, and this rolling contact does away the wear between the tappet and the cam. There being no sliding contact, it is not necessary to lubricate the face of the cam, or the tappets, consequently there is no oil or grease in the bottom of the cam case, and the trouble arising from getting the friction belt greased is obviated.

This cam is a double cam, on which two rollers are in contact at all times; in fact, you might say there are three rollers in contact, two on one side and one on the other. This makes it impossible for the wire to be pushed out of position by any hard substance in the clay bar, or, in other words, the wire must always travel in the straight path as determined by the shape of the cam. The only deflection will be a deflection through the elasticity of the wire itself, and even a large stone cannot push the wire, and, with it, the tappet wheel, away from the face of the cam. If the wire won't deflect enough for the hard substance, the wire will be broken on the new cutter, and in stony materials the breakage of wires will be greater on the new No. 8 Cutter than on the the old one. Where the clay is well prepared the brick will be cut straighter, and this condition will be maintained with little or no expense for renewal of parts, for very much greater time than is possible with the old cutter where the wear takes place between the tappet and cam.

One of the illustrations also shows a spring wire cleaner applied on the delivery belt side of the cutter, instead of on the die side. This device cleans the wires more effectively than the old rubber belt. The new wire cleaner can be supplied for attachment to any of the older patterns of Chambers End Cutters.

The cutter is running at Columbus, Miss., at Baltimore, Md., at Tip Top, Va., and on the yard of the Equitable Brick Manufacturing Company, Philadelphia.

Sand-Lime Brick in England.—The success which has attended the sand-lime brick in Germany has not escaped notice abroad. From nearly every country, during the past six years, a number of strangers have come to Germany to visit the numerous and different kinds of sand-lime brick works. It is very certain that no pains have been spared to present the production of sand-lime brick in the most favorable light.

It does not appear that these efforts have everywhere fallen upon fruitful soil, for the total number of factories in foreign countries to-day does not reach half the number of sand-lime brick works in Germany. Germany, in consequence of this, still stands, with over 100 more sand-lime brick works, at the head of all the nations. Next follows the United States of North America, with only thirty works. Of the great countries, Russia, Austria-Hungary and France, each can show not much more than four works, so that little Netherlands, which has also four sand-lime brick works, is, in this respect, quite remarkable.

That Great Britain, so far as is known at the present time, should have only two sand-lime brick works in which the hardening is done by steam, is very strange because, during the nineties, a large number of presses for sand-lime brick were obtained from England.

At the close of the Boer war it looked as if this industry had a great future in South Africa, but so far this has not proved to be the case, and the outlook is not encouraging there. As for the other British colonies, no reliable data has been published respecting the introduction of sand-lime brick manufacture.

One of the English sand-lime brick works was built several years ago. This is at Brandon Park, and belongs to Baron V. Barreto; the other, which bears the title of "the first London lime-sand brick plant," is in the London district, at Wandsworth on the River Thames. Here, the same as at the sand-lime brick works at Asnieres, near Paris, the raw material—the lime and sand—are carried by water. The machinery and the entire plant has been built as simply as possible. The ground lime and the sand are measured in right proportions by a machine, thence carried up to a mixing machine; here the materials have the right quantity of water added to completely slake the lime. From the mixing machine the material falls into a wet pan, where it is ground sufficiently and brought into the right condition of dampness, etc., for pressing. It is then pressed and the bricks pass to the steam chamber for hardening. The finished sand-lime bricks are taken by water or by rail to the city, where the great activity in building offers a good market.—*Thonind. Z.*

Sand-Lime Brick Patent.—According to Karl Abrendts' German patent 152190, there are difficulties in the manufacture of sand-lime brick, caused by the sudden action of the steam on the pressed bricks in the hardening chamber. The steam condenses upon the damp bricks and disintegrates them into mud before the hot steam can form the necessary calcium silicate. The cause of this is that the soda waste product, used in the original Ahrents process, consist largely of calcium chloride. This fault is removed under the additional patent referred to above, in as much as the mixture of soda waste products, lime, sand, slag, etc., has sufficient water added to enable it to be easily worked. After pressing the bricks the excess of water is got rid of by keeping the bricks from ten to twelve hours in a dry heat before subjecting them to the high pressure steam.—*Thonind. Z.*

Hardness of Water.—If the water is hard it contains lime or magnesia salts. The presence of these can be determined by dissolving soap in water and well shaking the solution. If the foam resulting from this stands for some time, then there is either lime or magnesia in the water. If the water contains iron, we can readily show this. Take two glasses, fill the one with rain-water, in the other put the water to be tested. In each glass put four to five grammes of powdered nut galls. If in a few minutes the water changes to a brownish color, but if it remains only slightly yellow, it is free from iron.—*Keram Rund.*

Durability of Sand-Lime Brick.—We have already published a caution against the use of sand-lime brick for underground work where there was a possibility of water containing carbonic acid seeping in, as there would be danger of the brick being weakened. It is true that in the tests that were made the difference was not very great between the regular sand-lime bricks and those submitted to the influence of water containing carbonic acid, but still the danger is present and grows with time. In some further tests in this matter a crushed sand-lime brick was used, treated with water containing the theoretical quantity of carbonic acid needed. The whole of the lime was dissolved out. It is known that in the sand-lime brick only a small proportion of the lime combines with the silica; the greater part of it remains free. The cementing together of the grains of sand is to be ascribed chiefly to the lime silicate. It therefore appeared possible that the carbonate water would only dissolve the free lime hydrate and not that which was combined with the silica. In such case the conditions would be less dangerous for the stability of the brick. For the purpose of the tests we procured several kinds of sand-lime bricks and crushed them. We then determined the total lime in the powder. We calculated how much carbonic acid was required to convert the lime in the material into a soluble calcium carbonate, whereupon we treated small quantities of the sand-lime-brick powder with suitable proportions of carbonated water. As in the instance stated above, the whole of the lime that was present was dissolved so that the composition of the brick was completely deprived of its binding properties. It is proved by this that no matter how dense and sound a sand-lime brick may be, the dissolving and disintegrating action of carbonated water will destroy it at last, provided the action of the water containing the carbonic acid in solution continues long enough. We must not confuse this action of carbonated water with that of the effect of carbonic acid gas in moist air upon the sand-lime brick. The gas in the damp air converts the free lime into calcium carbonate, which increases the strength of the brick, but in the solution of carbonic acid in water the process goes further into bicarbonate, which is carried away by the seepage water. It may be a long time before any signs of disintegration are noticeable, but destruction at some time, under these conditions, is inevitable. If it is proposed to use sand-lime bricks for wells, for mine work or for springs, we should first test the water to find whether it contains carbonic acid. If it does, then sand-lime bricks should not be employed.—*Thonind. Z.*

Proposed Reduction of Hours.—The working brickmakers of Lippe, from whose organization, "The Working Brickmakers' Society of Lippe," we have not heard much for some time past, gives promise of renewed activity in consequence of a number of new members having joined the society lately. The official organ, *Good Burn,* informs us that the society will devote its efforts to sub-contract prices and the wages question generally, commencing at once in the Bochum district. In the summons to the members we read that: "The day's work must be shortened so that this shall not last more than thirteen hours; that is to say, beginning at 5 o'clock in the morning, the work must cease at 8 o'clock at night. This, with the two hours' rest, will make thirteen labor hours, which is still the longest working time for any occupation. In order to make up for this shortening of the hours the price of the work must be increased 10 per cent. Also, there must be a reduction in the output of from one million to about one hundred thousand, according to the conditions in any particular district." —*Keram. Rund.*

A New Method in Brickmaking.—Since the revival of interest in sand-lime brickmaking, and thanks to the immense amount of advertising that "inventors" have recently done in this field, making small changes in the process and taking out patents upon the strength of these, there has arisen a succession of new inventors who seek to gather in the laurels of their predecessors and do not rest until they, too, have invented something fresh and have patented it. The most of these inventions remain in the Patent Office, as, for instance, the addition of muriatic acid, and are not really adopted in practice, or, if they are, they have not the least effect upon the product, except that they increase the cost of it, on the one hand by the employment of the invention and on the other by the royalty which the inventor collects. To the list of these peculiar inventions belongs the following, which we feel we ought not to conceal from our readers: "The subject of the present patent is for a process of rapid hardening of artificial stone or artificial wood. According to this process the most rapid hardening of an artificial stone or wood material, formed of lime, sand, etc., is brought about by the admixture of a solution of sugar or similar matter and heating by a mixture of steam and gas, by which means a bond is produced more speedily between the smallest particles of the mass." It is well known that, following upon Dr. Michaelis' invention of many years ago, in which a mixture of sand and hydrated lime in a mortar-like mass was hardened by superheated steam, various methods have been worked out for making artificial stone and have been put into practical use; but in all these methods superheated steam alone was used and no carbonic acid. It was sought to overcome this disadvantage by mixing gases (products of combustion) from the furnace with the steam, using the steam and furnace gases for hardening the mixture of sand and lime. Any such method, however, suffers from the fact that the gases carry with them soot and ashes, which come into contact with the soft bricks and spoil their appearance. In addition to this it is found that the bricks hardened in this manner are very brittle. In addition to all this the mixing of such things as sugar, milk, molasses, etc., with sand and lime for the purpose of forming an artificial stone is a very old idea. The patentee of the above is Wilhelm Gutzeit, Charlottenburg, Germany.—*Deutsche T. & Z. Z.*

MECHANICAL DRAFT APPARATUS.

THE APPLICATION of fans to induced draft work has made necessary many changes from the established standards of fan builders in order to avoid difficulties never met with in other lines of fan work, and even hardly anticipated in this. Most of the fans on the market to-day are built with two or three spiders, except in the very small sizes. A fan of the standard type usually has a bearing on each side of the fan, making the distance between bearings comparatively short. With this arrangement there is no deflection to the shaft, and the fan wheel is very smooth-running. But when these fans have to be adapted to the handling of hot gases, it is positively necessary to keep the bearings removed from the path in which the gases travel, as the bearings would become overheated. This necessitates either having an overhung wheel or placing one bearing outside of the inlet chamber built onto the side of the fan. Unless the bearings were placed very close to the center of the fan, the overhang will cause deflection, which will work the keys loose and more likely cause the fan wheel to strike the housing. The same is in a large measure true of the two bearings far apart. Increasing the diameter of the shaft is not a relief, as by its own weight it will deflect. Then again, the intense heat within the housing causes it to expand, and as the steel framework of the housing is outside and at a much lower temperature than the shell, the natural curvature, if any, is inward. Just how much this expansion will amount to can never be predetermined. Hence, the greatest of care in setting up will often prove of no value when the fan is put into operation, causing the wheel to strike on one or the other of the sides or at certain points.

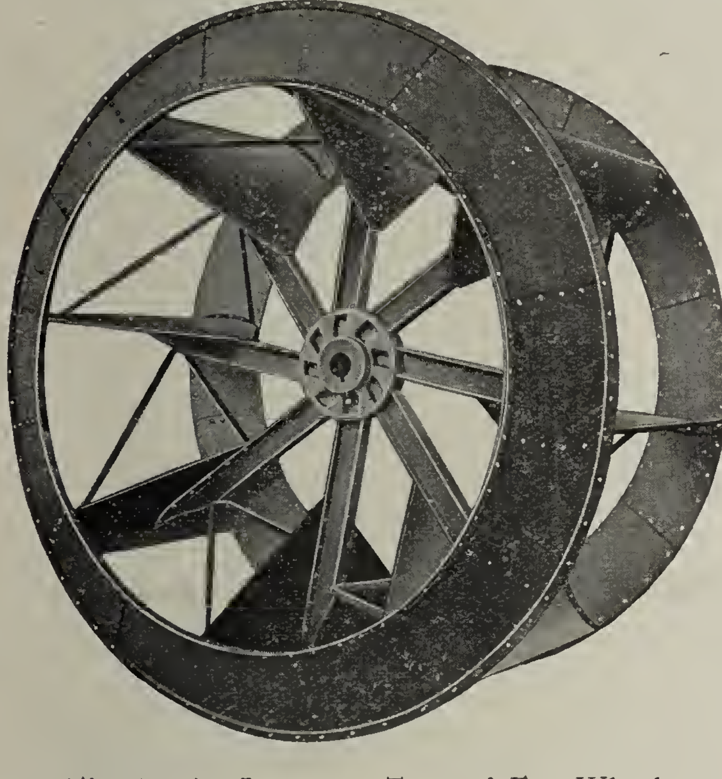


Fig. 1. An Improved Type of Fan Wheel.

These are points for very serious consideration with any one who has had experience with this line of work, and the American Blower Company have devoted a great deal of time to the improvement of these details. Figure 1 shows a wheel of their latest type of construction, a number of which are in operation and giving entire satisfaction. The spider is made up of "I" beams, which have about three times the strength of a double set of tee arms, as usually employed. In addition to this, every blade is braced with bar iron braces from the outer rim to the center, which completely overcomes any tendency to twisting. In the side of the fan housing is built a very deep cone which reaches in close to the hub. A special arm of very heavy construction is built of the cantilever principle to carry the inner bearing, which is water-jacketed. This is placed at the very apex of the cone. The distance from the end of the apex to the end of the projecting shaft seldom exceeds a foot.

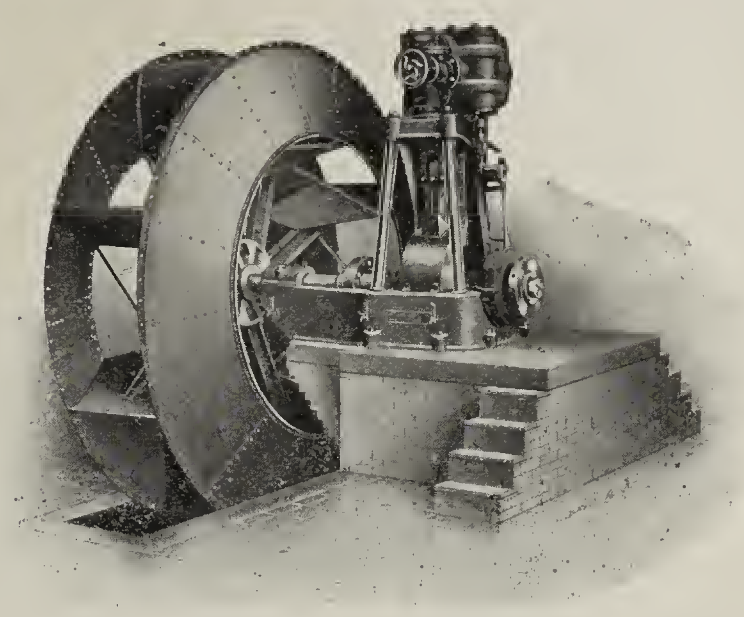


Fig. 2. Direct-Connected A B C Fan Wheel for Mechanical Draft Plants.

Figure 2 shows a fan wheel mounted on a shaft with a direct-coupled engine erected on this form of construction. It is not always customary to make an extension of the base of the engine as here shown. In some cases an "I" beam grillage is built into the brick foundation, the engine being set on top of the outer ends of these "I" beams and anchored down, which make practically a complete unit of the entire outfit, as shown by Figure 3.

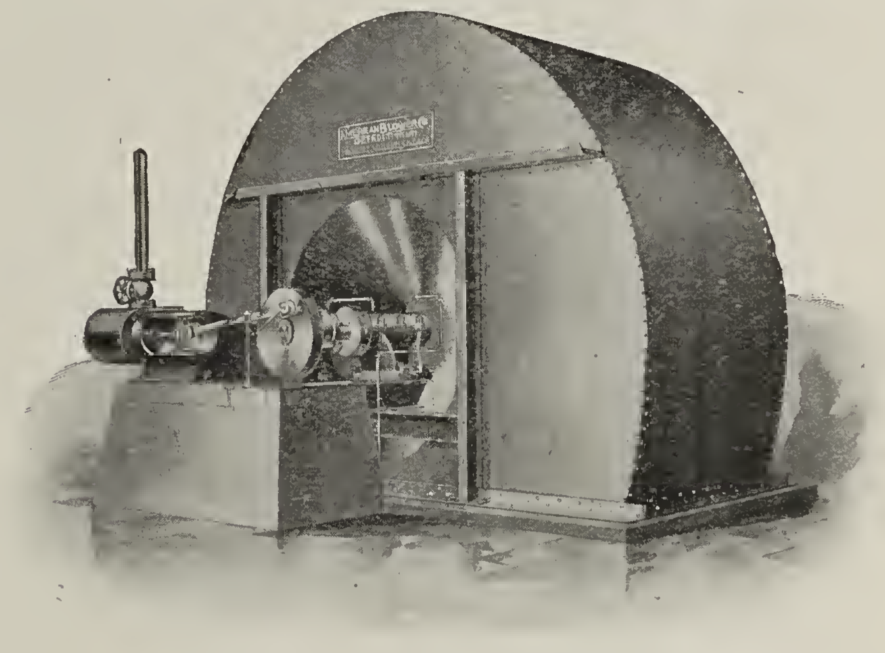


Fig. 3. An A B C Fan Housed In.

Two large units of the character shown by Figure 2 have been furnished the Wilkes Barre & Wyoming Valley Traction Company, of Wilkes Barre, Pa. These wheels are encased in a three-quarter steel plate housing, the wheels being 11 feet in diameter and driven by 12x10 vertical engines. They are intended to furnish induced draft in the power house in the above railway plant.

Written for THE CLAY-WORKER.

WASHINGTON BRICK AND BUILDING NEWS.

THE BRICKMAKING season now coming to a close as winter approaches has been fairly prosperous in and near Washington, but there has been a falling off as compared to the output of last year amounting to a few millions of brick. Factories are still running, however, and demand still continues. It is possible that next year's demand for brick will be greater than this year's has been, owing to the fact that the several large Government buildings now started or planned will call for several millions of brick. Then there also will be much sewer work, the new sewer-pumping plant, the new union railway station, private dwellings and other building operations, all of which will call for large quantities of brick.

The output of brick for the Washington market will very probably be greater next year than that of 1904, for there will be a number of new contributors to this market. A brick plant has recently been started at Chesapeake Junction, a few miles from this city. The proprietors are Messrs. Cook & White. The factory is employing thirty hands and its capacity is about 30,000 bricks per day.

Another plant of 20,000 daily brick output has begun business at Beltsville, Md. Mr. Daniel J. Ready, of this city (Washington), is the owner.

Mr. Thomas R. Riley, of Washington, is now putting up a machine plant for making brick at Brentwood, D. C. This factory will be running next spring and will have a capacity of about 50,000 bricks per day.

If the increase in brickmaking plants in the District of Columbia and nearby neighborhood continues, it will not be long before Washington becomes surrounded by them. This business now forms the largest manufacturing interest here, and was made so by the rapid building development of the city and suburbs, aided in a large measure by generous appropriations from Congress for Government structures. The latter, particularly, have caused the brickmaker to look upon this city as a good field for investment in clay land and brick machinery.

Up to the present time brick factories working for the Washington market have kept wheels turning—though sometimes not so rapidly as at other times—and it is probable that the new additions to the brick factory ranks will find a ready market for their output.

It is possible that after the completion of the big public buildings now projected or begun business in this line will be less active for some time, for it is not likely that this city will in the near future be again treated so generously by Congress. And the reason for this is that the necessity for new public structures will not exist in nearly so large a measure as at present. And it may be further stated that unless good manufacturing business is developed in the District of Columbia the building industry will soon grow less rapidly than at present.

Of course, at this time this city is not without capitalized industries outside of the large brickmaking business. The last census gives the District 2,669 enterprises, but the larger percentage of these are small. The capital invested in such business was put at $24,329,135, of which $3,310,548 was invested in land, $4,177,354 in buildings and $8,044,805 in machinery and tools. The value of the product of these enterprises was estimated at $37,780,267, and the number of employes 16,297.

This is not a fine showing for a place with nearly 300,000 inhabitants, including the whole District. A short trip from Washington—and through the "brick town," just across the Potomac River from this city, where are located a large number of the brick factories that form the biggest industry in connection with the Capital—there is the little city of Alexandria, about fifteen times smaller than its distinguished neighbor. Yet the Virginia city has three glass factories, shoe factories, an excellent brick factory, a shipbuilding plant, machine shops, foundries and other businesss interests of importance. So in several industrial matters Alexandria is ahead of the beautiful Government city. And I suppose this information will cause the enthusiastic Washington man to again bring up the old joke about the grass in Alexandria's streets and cows getting lost therein.

Long before Washington becomes a manufacturing "center"—if it ever so becomes—the transportation facilities here will have arrived at a condition more than adequate to all such demands. The Potomac River steamship service now offers excellent opportunity in this line, and railway facilities, upon the completion of the terminals and splendid union station at this place, will give the shipper all the other outlet source required.

This union station will be "a thing of beauty and a joy for—a long time." A distinguished writer says: "It will be in architectural design in keeping with the Capitol." But there is not a structure in this country comparable in beauty and grandeur with the National "Cave of the Political Winds." However, in size and cost the union station will give the Capitol a fairly close chase for its reputation in ground dimensions. It will be 780 feet wide, divided into two sections, 575 feet on longest front north and south, and 120 feet in greatest height. The three splendid entrance arches are to be 50 feet high, leading into a vestibule, thence into the main waiting room, which is to be 220 feet long, 130 feet wide and 90 feet high. This room is to have windows 75 by 30 feet in size, with panel decorations.

The main waiting room has around it a number of apartments, including a dining room 80 by 100 feet in dimensions; waiting room for women, 85 by 30 feet; smoking room of like size, parcel room, lunch room, telegraph and telephone offices and baggage room. There will be other rooms on this floor, and on the upper floor will be located the company offices and a dormitory for railway employes, with capacity for 100 men. The porticos around the building are to be about 1,100 feet in extent. The train lobby, extending northward from the edifice, will be 760 feet long, and there will be room for 33 tracks.

The union station starts upward with huge concrete foundations. On these the granite structure will rise, but all the walls will be reinforced by brick—common red brick. It will require 14,000,000 of these for this work. The brick are now being obtained from the Laurel Clay Product Co., at Laurel, Md. The cost of the station and improvements connected therewith will be about $14,000,000. The cost of the United States Capitol, building and grounds, up to date, it may be stated, has been about $20,000,000. The number of bricks in the lining of the Capitol—at once stated in THE CLAY-WORKER—is about 15,000,000. Whatever kind of structure man builds, if it is of any importance, he sensibly backs it up with brick—if it is not built entirely of that product.

The progress of work at the Washington Arsenal grounds, where the War College and Engineering School buildings are being built, has been fairly rapid this summer and fall. This building enterprise is a very large one and all the houses excepting the War College edifice are of red brick. But the War College will contain a large quantity of this material—4,000,000 brick. It will also contain over $100,000 worth of granite and $65,000 worth of other stone. The whole cost of the building has been estimated at $750,000.

It may be remembered that there was a strike by the union bricklayers on this building, which resulted in leaving only one man—a negro—at work there. The union men stayed out and the negro stayed in, keeping at his solitary job, and evidently the "in" got the better of the "outs." During a recent call at the Arsenal grounds I was told by Mr. Wilmark, the architect in charge of the War College work, that forty men were then engaged laying brick on the building.

"How many negroes?" I asked.

"Thirty," said he.

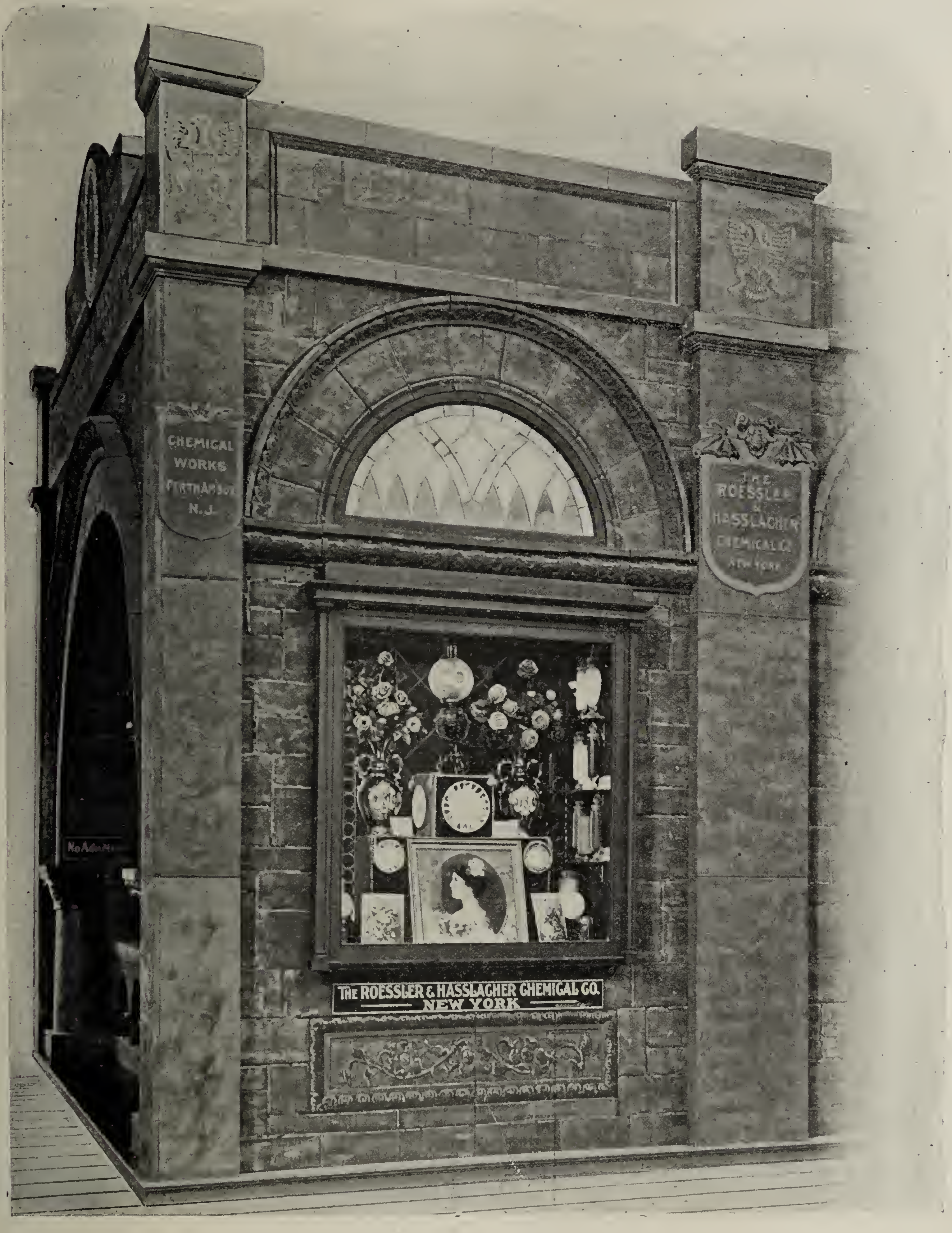
Well, I knew the negro was a pretty fast multiplier, but that jump from one lone "coon" to a whole menagerie in so short a time was surprising.

One of the pretty features in the building scheme at the Arsenal grounds—which comprises many structures, large and small—is a row of thirteen red brick dwellings in colonial style, forming with their white, round columns a long and impressive colonade.

NICODEMUS.

EXHIBIT WHICH WON A GRAND PRIZE AT THE WORLD'S FAIR.

WE ARE PLEASED to present to our readers a picture of the World's Fair exhibit of the Roessler-Hasslacher Chemical Co., which has been awarded a Grand Prize. The display is of particular interest to ceramists, and includes many fine specimens of porcelain, china, glassware and other bric-a-brac decorated with the products of the Roessler-Hasslacher laboratories at Perth Amboy, which are perhaps the best equipped for the production of ceramic materials on this side of the Atlantic. They have long made a specialty of materials used in the production of enameled pottery, and clayworkers desiring any of the necessary ingredients for this work, such as metallic oxides, oxide of tin, ceramic colors, liquid bright platinum, liquid bright silver and liquid bright gold, etc., etc., can always obtain same from this firm, and they are always sure to get a high quality and the most reliable materials known to the trade. The firm certainly were entitled to the distinction accorded it by the Louisiana Purchase officials.


CHEMICAL WORKS PERTH AMBOY N.J.
THE ROESSLER & HASSLACHER CHEMICAL CO. NEW YORK
THE ROESSLER & HASSLACHER CHEMICAL CO. NEW YORK

OFFICIAL ANNOUNCEMENT.

The Nineteenth Annual Convention of the National Brick Manufacturers' Association, to be held at Birmingham, Ala., January 30th to February 11th, 1905.

THE EARNEST "call" from the Southland has been heard and heeded, and while due consideration has been given the claims of other cities, from which similar invitations were received, the home of Treasurer Sibley is easily the first choice for our 1905 convention. We have been influenced not a little in this decision by the accessibility of Birmingham. Located on the great Trunk lines of the South, it can be reached by fast through trains from almost every section of the country, and while situated far enough south to insure mild weather, and out-door pleasures, it is not so far south as to be difficult to reach, even for those whose time is limited.

Birmingham is but a night's ride from Cincinnati, and so may be easily and quickly reached by the large number of our members residing in the Central States. It may also be reached with almost equal facility by our eastern members, who can make direct connections via Washington. While the western members will have the advantage of through trains direct from the principal cities of Texas and the States lying north of the latter and west of the Mississippi river.

The get-at-able-ness of Birmingham will appeal to all of those who feel that they can spare but a few days from home at that season, and to those who can arrange for an absence of a couple of weeks or more, it will appeal irresistibly, for a series of most delightful side trips to points further south, such as New Orleans, Mobile, Tampa, Jacksonville, and other Florida points, may be planned. Those going via Cincinnati will be afforded an opportunity of stopping off at Chattanooga, where they can visit Lookout Mountain and the famous battlefields of that section, which are now reached by trolley car from Chattanooga.

Birmingham is a beautiful and thoroughly up-to-date southern city, and with her suburbs now has a population of over 100,000 people, and affords unexcelled facilities for a successful convention, including a splendid modern hotel, the Hillman House, which will be headquarters during the convention, and an ample convention hall and exhibition room for the display of brickmaking machinery, etc.

There are all kinds of brickmaking plants in the vicinity of Birmingham, all of which, it is anticipated, will be in operation, thus affording delegates an opportunity of fully investigating the *modus operandi* of the various factories, which include up-to-date soft clay, stiff clay, dry press and sand-lime processes; also a large sewer pipe plant and extensive chemical and metallurgical establishments, the doors of which will be thrown open to our members.

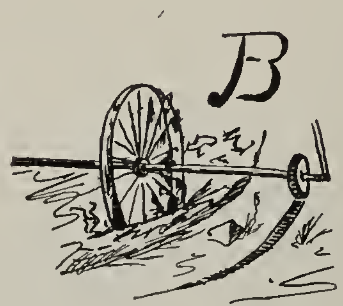
REDUCED RAILROAD RATES.

The Southeastern Passenger Association has authorized reduced rates to the convention on the basis of one and one-third fare on the certificate plan, or a two-thirds rate for the round trip, such as the Association has enjoyed in years past. It is anticipated that all the other passenger associations will concur in this action, and the reduced rates will be obtained from all sections of the country. It is also planned to have special rates to points further south for those who want to make the side trips. Return tickets will be good until midnight of Wednesday, February 15. A special trip is contemplated to New Orleans, for which it is hoped a still lower rate will be obtained. Further particulars in this connection will be announced subsequently. Those desiring information relative to requisite of membership, etc., are requested to communicate with the Secretary, at Indianapolis.

THE EXECUTIVE COMMITTEE,
W. S. Purington, *President.*
Theodore A. Randall, *Secretary.*

Written for THE CLAY-WORKER.

ST. LOUIS BRICK AND BUILDING NEWS.



BUSINESS WITH the brick and terra cotta manufacturers of St. Louis has been very good the past month. The brick yards have all been busy getting ready for the trade that they expect in the near future. There is a great scarcity of brick-setters, however, and they are hard to get, although they have been much sought for.

Some good-sized contracts for brick have been recently let, such as brick for school houses, large manufacturing and wholesale houses, and several contracts for brick for big wholesale buildings such as the Crunden-Martin Wooden Ware Co., the Hamilton-Brown Shoe Co., etc., are coming on in a few days. The prospects for a good season are exceedingly bright.

The rush of the Building Commissioner's office recently presages a winter of activity in construction. On all sides one sees evidences of a building boom in St. Louis, and it grows out of a healthy demand for dwellings and stores. Hundreds held back, taught by the lesson of Chicago in 1893, and as a result the city is underbuilt. Houses are so scarce that the agents' list of rentable property has dwindled to a few items, and it promises to remain so for some time, despite the natural exodus from the lodging-house and boarding-house district when the transients depart after this month, when the World's Fair is a thing of the past.

The district east of Fourth street, from Chouteau to Washington avenues, has received much attention of late. Three, five and six-story warehouses and commercial structures, built to last a century, with heavy walls and timbers and modern elevator and sprinkling systems, are being reared and have been reared on many corners, and the general tone of the locality has improved and will improve, judging by the inquiries at architects' and realty agents' offices. The commercial section is bursting its bounds, due to the rapid increase of business here. The territory south of Market street and west of Seventh street has spread eastwardly to the river, south past the Mill Creek Valley and west to Eighteenth street. Vacant corners are growing scarcer and old structures are being wrecked to make room for the new ones right and left. The agents speak enthusiastically of this line of exploitation, and some are making a specialty of handling only commercial and manufacturing property.

That the approach of the closing of the World's Fair has not affected building in St. Louis to any extent is shown by the comparative permit record for the months of October, 1903, and 1904.

Last year during the month of October building in St. Louis, especially in the West End, was at its height in preparation for the World's Fair, but the same period this year runs only $207,938 behind.

The report of the Building Commissioner shows the following permits issued last month and their estimated values: Brick buildings, 198, $1,240,660; frame buildings, 317, $53,570; additions, repairs and alterations, 149, $156,959; total, $1,451,195. The permits issued in October, 1903, numbered 470 for buildings, estimated to cost $1,659,133.

The Gaffney Vitrified Press Brick Co. made an assignment a few days ago to Harry G. Knapp for the benefit of its creditors. The property is valued at $10,000.

Prices of brick, while about the same as they have been for some time, have stiffened somewhat on account of the demand.

Prices quoted are about as follows: Merchantable brick, $7.25; strictly hard and red, $8; ordinary hard and red, $7.50; front red and stock, $18, and sidewalk and paving, $10.

The Scott Manufacturing Co. report a good business with their brick machines, and quite a number of orders have recently been booked. "The press that Scott builds" is certainly catching on. Several sales have also been made recently of Scott clay pulverizers, Scott clay mixers and Scott dry presses. A SAINT.

WESTERN ELECTRIC COMPANY'S NEW PLANT.

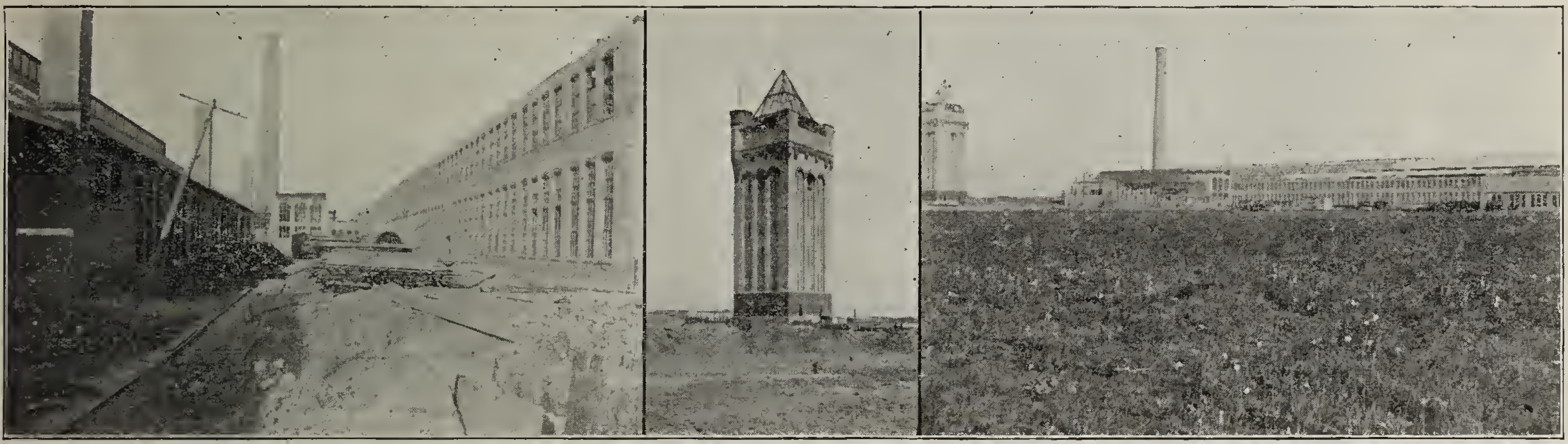
ONE OF THE largest jobs in brick being carried on in Chicago this season is that of the new and huge plant under construction for the Western Electric Company, near Hawthorne. The plant, which consists of a great number of buildings, is situated in, and pretty well covers, a forty-acre lot extending along South Forty-eighth avenue. In round numbers the total cost is estimated at $1,600,000, and the total number of brick used in the construction of the "industrial city of brick" will run in the neighborhood of 15,000,000.

The pressed brick, used chiefly in the office building and along the Forty-eighth avenue front, were furnished by S. S. Kimball. The common brick were furnished by the Chicago Brick Company.

The Western Electric Company have been laying their plans to move into the new establishment for about two years. They have already disposed of their future leasehold in Clinton street, south of Van Buren, necessitating their removal from their old location before spring. It is expected, however, that the entire plant will be ready for occupancy and operation by early winter. S. A. Treat is the architect who designed the buildings and planned the arrangement of the entire group.

The entire affair is thoroughly modern in every respect. The drainage is believed to be perfect. The heating system has been gone over carefully, the heat, power and light being conducted from the main power-house to every other building in the plant through huge masonry tunnels, which thread the area beneath the plant with an underground network.

One of the features of the plant is the great water tower, which stands at the head of the private reservoir constructed for the company. This tower, which is square and of decidedly picturesque appearance, rises to a height of about 150 feet. Like all the rest of the plant, it is of brick construction but the selection of material, however, has been such as would go well with a structure modeled along the lines of a watch tower or citadel of the middle ages. Seven tanks within the tower afford a capacity of half a million gallons. In addition to its own water tower, the company will have its own gas plant. This like the water tower, and a number of other important buildings, is the work of the Falkenau Construction Company, who made a record for their part in the building of the plant.



Views of the New Plant of the Western Electric Company, Near Chicago.

SOIL DRAINAGE.

Surface drainage, as commonly understood, is accomplished by open ditches, which, in addition to receiving and removing water from the surface of land contiguous to them, may if sufficiently deep act as receiving drains for water which percolates through a porous substratum through which the ditches are excavated, and under such conditions facilitate underdrainage as well as carry off water from the surface.

The advantages of removing water downward through the soil instead of over the surface may be briefly stated as follows:

The surface soil is retained entire, instead of the finest and most fertile parts being carried off with every considerable rainfall. Any plant food in manure or other fertilizer deposited upon the soil is carried into it with the water as it percolates downward from the surface, and so becomes thoroughly incorporated with the soil.

Rain water as it passes through the soil serves a most useful purpose by dissolving and preparing crude soil material for the nutrition of plants.

The soil, having been well prepared, is at all times during the growing season in readiness for the growth of plants, such growth not being hindered by stagnant water or saturation.

The frost goes out earlier in the spring, so that the planting season opens one or two weeks earlier than in the case of soils affected by surface drains only.

Where stiff clays are found the soil is made more porous, open and friable and roots penetrate more deeply than they do into surface-drained soils.

The effects of drought are diminished, as has been found by experience, owing to the enlarged and deepened soil bed and to the more favorable condition of the surface for preventing excessive evaporation of moisture.

It aids in making new soil out of the unprepared elements, since it permits a freer entrance of air and atmospheric heat which disintegrates soil material hitherto unavailable for use of plants.

Stubborn and refractory soils when drained are frequently so changed in texture and mechanical structure that they become easily managed and respond to cultivation with abundant crops.—*Farmers' Bulletin No.* 187.

"If there is one enterprise on earth that a 'quitter' should leave severely alone, it is advertising. To make a success of advertising one must be prepared to stick to it like a barnacle on a boat's bottom. He should know before he begins it that he must spend money. Somebody must tell him, also, that he cannot hope to reap results commensurate with his expenditure early in the game. Advertising dosn't jerk; it pulls. It begins very gently at first, but the pull is steady. It increases day by day and year by year until it exerts an irresistible power."—John Wannamaker.

Written for THE CLAY-WORKER.

INDIANA'S GREAT WATER CURE.

A Charter Member of the N. B. M. A. Sees in It an Attractive Place for a National Convention.

A TRIP TO THE St. Louis World's Fair via the Baltimore & Ohio Railway gave me, recently, a long hoped-for opportunity of visiting the famous watering places, French Lick and West Baden, Ind. That I was delighted with both places goes without saying to all who have been there, for they are beautifully situated in a delightfully picturesque country. They are located about midway between Cincinnati and St. Louis, a few miles from the main line of the Baltimore & Ohio Railway, with which they are connected by a branch road.

West Baden and French Lick may well be dubbed the "Twin Cures," for they are but a mile apart, being connected by a trolley line, so to visit one is to see the other, and each month hundreds of men and women afflicted with rheumatism and similar ills find relief in the health-giving waters, which bubble from Mother Earth clear and cool. I went to French Lick first because I knew its manager, Mr. Tom Taggart, who has figured so conspicuously in national politics of late, and rejuvenated on his noted Pluto water, which is a veritable life-restorer for worn-out and fagged humanity. Mr. Taggart has certainly erected a lasting monument to his skill and ability as a hotel man, for here in this Hoosier wilderness he has established as elegant a hotel as one may ever care to stop at.

Knowing all this, as you must, Mr. Editor, for I have heard you speak of Mr. Taggart and his resort, why in the name of goodness have you never taken the National Association to West Baden? Can it be possible that you don't know what a splendid place this would be for a convention? If so, you had better wake up, look about and post up on the attractions of your own State. I, for one, would like to spend a week or two every winter at this great watering place, and feel confident that a yearly meeting there would lengthen the years and sweeten the lives of many of the members of the National Association.

After a few days at French Lick I moved to West Baden, and was really astounded at the magnitude and character of the hotel there. I have traveled a lot in my time, but have never seen anything in the form of a hotel that compares with that. I think it is well-nigh marvelous that such an immense and elegantly equipped hotel should be built there in the hills of southern Indiana. Surely, the water must be life-giving, and more, for I was told that the proprietor built this great place, costing hundreds of thousands of dollars, from the earnings of his old hotel, which was burned some three years ago. The new hotel is a great brick structure, really fireproof, they claim, which in itself is of sufficient interest to brickmakers to justify a trip across the country to see. It could not be better adapted to convention purposes if it was built for that alone. I am so impressed with this idea, and so in earnest about holding a convention there, that I am going to give you some data about it, and the hotel manager promised to send you some pictures of the what he terms the "Eighth Wonder of the World."

THE NEW WEST BADEN SPRINGS HOTEL.

This structure was built in 1901 and 1902, and is absolutely fireproof, being constructed almost wholly of brick and concrete on a foundation of solid stone. No wood whatever, excepting the door and window casings, entered into the construction. The hotel building proper is octagonal in shape, surrounding a large central court, which covers five acres. The total floor space in the hotel covers fifteen acres. The building is six stories in height and contains 708 guest rooms, each room provided with bath, toilet, clothes closets, stationary washstand, with hot and cold water, and long-distance telephone. The central court is 200 feet in diameter, 135 feet high to the highest point in the dome, which is of steel construction. The only other building having a dome of steel is the Capitol at Washington, that being only 120 feet in diameter. The floor of this court is constructed of cement laid on solid rock. In the center of this court is a large fountain, surrounded by evergreens, palms and hothouse flowers, making this large court a beautiful summer garden, lighted by electricity, softened to resemble a bright moonlight night—a grand place to promenade. One of the attractions of the court is the mammoth old-fashioned fireplace used in winter. It takes in fourteen-foot logs.

General View of the New West Baden Hotel—"The Eighth Wonder of the World."

In addition to the guest rooms, which will accommodate 1,200 people, there are thirty-one parlors, a ball room 84x94 feet, main dining hall 80x94 feet, and six private dining rooms. The office rotunda is 100 feet in diameter. Connected with the hotel by arcades are the bath rooms, the largest in the world; a gynasium, an opera house, and a casino, with bowling alleys, billiard and pool tables and club house. Near the casino is a covered oval two-story bicycle track, the main field having baseball and tennis courts. Located on the ground floor, opening into the court, are the West Baden National Bank, a drug store, furnishing goods store, and a depot for Oriental goods; also barber shop. West Baden Springs have become the best known and one of the best patronized spas in America, the waters equalling those of Carlsbad, from which it takes the name, "The Carlsbad of America."

West Baden Springs, of which there are four, are recognized by the leading physicians of the country to be the best in the United

States for curing of rheumatism, stomach, liver and kidney troubles, skin diseases, such as eczema, and kindred troubles; nervousness, and for the upbuilding of those run down from overwork, sleeplessness and other causes. Here is located No. 7, "the greatest spring in the world." Its flow is greater than all the springs in the valley, and contains more sulphuretted hydrogen than any spring in America.

The West Baden Springs Hotel was designed in all its details by its owner, the Hon. Lee W. Sinclair, who claims the distinction of putting up the most thoroughly fireproof hotel in America.

I repeat, Mr. Editor, it would be a great place for one of our yearly meetings. A DOWNEASTER.

Written for THE CLAY-WORKER.

DOWN IN JERSEY.

SINCE I WROTE you last, business in the clay manufacturing lines has gone on in about the same condition as at my last report. Much hollow brick material has been piled up in the factory yards, owing to the strike of bricklayers and labor of other trades in the city. The clay miners have been shipping raw clay, but all complain of the dullness of trade.

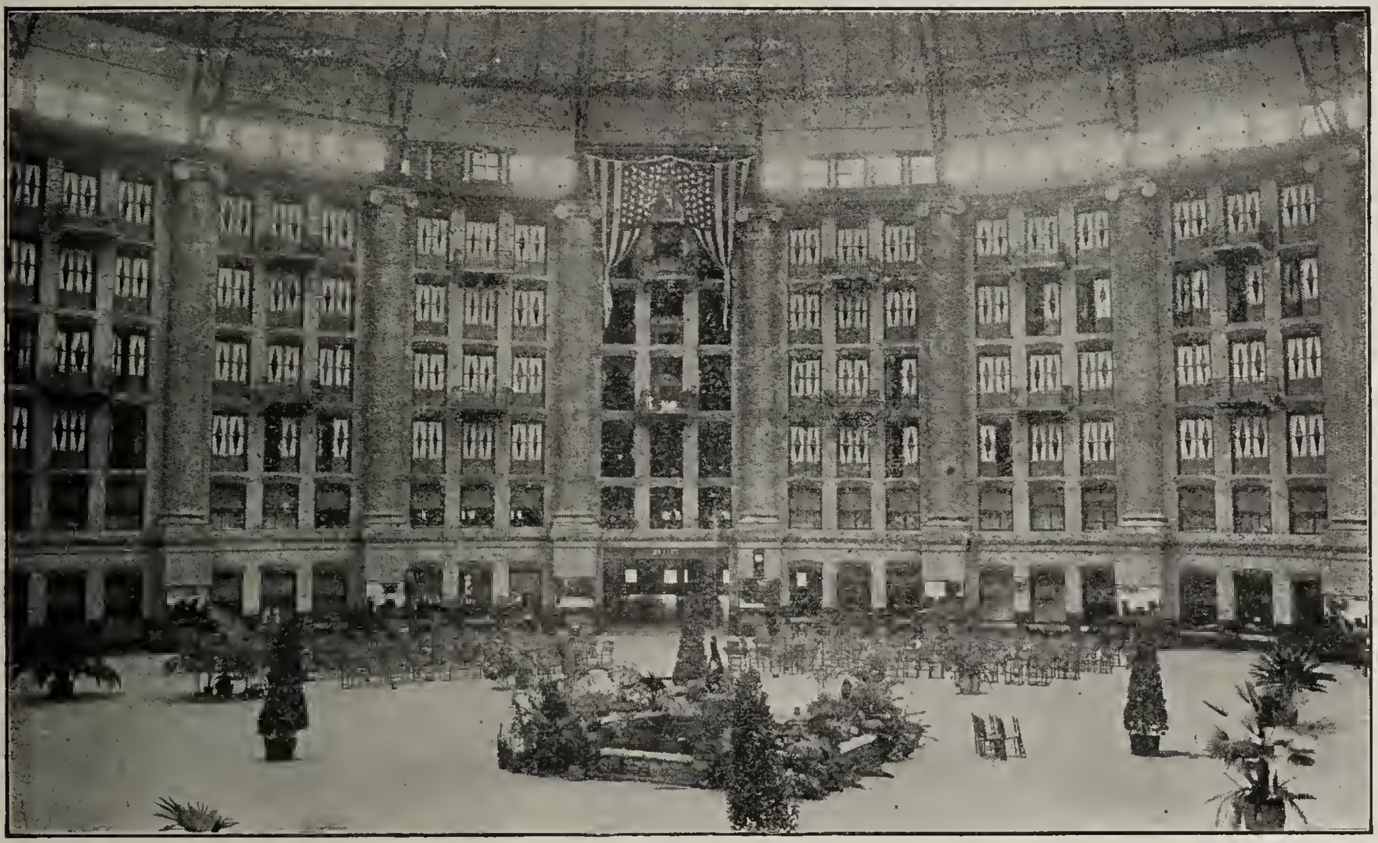
A visit to Bloomfield's mines yesterday found seventy-five men at work mining and loading several boats for Eastern trade. It has always been a mystery to the writer how factories can buy this clay and pay freight on long hauls and compete with factories right here on the ground. But they do it, somehow.

At a political meeting last evening at Perth Amboy, we ran up against our old friend, George Parsons, chief bookkeeper at Perth Amboy Terra Cotta Company's plant, who informs your scribe that Mr. Philip Gibson, formerly of Amboy, but for a number of years past in business at other points, had decided to return to Perth Amboy to spend the remaining days of his life. We sincerely hope this is true, for if there was ever a man connected with the clay industries that we felt under more obligations to for information of a valuable kind, it was Philip Gibson. He and his family have many warm friends in Amboy, and we know he will be welcomed with open arms. We also had the pleasure of shaking hands with Mr. Larry Brown, formerly chief burner of the Perth Amboy Terra Cotta Company. Mr. Brown is now with the C. Pardee Works, and has charge of the shipping at that point.

Never in the history of Perth Amboy have so many brick buildings been constructed in one season as during the present one. On all hands new structures are going up, and it is gratifying to note the great improvements being made in all parts of the city.

Washington street, a fine street reaching from the Sound across the city, has been paved with brick, and during a drive over it last week we could hardly realize we were on the same street that was formerly full of holes, and, in time of mud, "out of sight." The City Council has just let a contract for the same kind of a pavement on the north end of State street. There is warm competition between brick, bithulitic, wood block and asphalt. Now, the two latter are manufactured in Perth Amboy, or, rather, the materials for same. If the city keeps on its progressiveness it won't be long until all the streets are paved, and then it will be a comfort to drive over them. Now one can get a good "jouncing" over the holes in unimproved streets.

A great many people are using the second grade of underground conduits for building purposes in this section. These are purchased of the National Fire Proofing Company of Perth Amboy. If these are laid neatly they look very well. A complaint I have heard in regard to the use of these conduits for outside walls, in this: The moisture passes through the mortar joints and makes the walls damp inside. I believe this could be overcome by painting the joints thoroughly with asphalt paint after the mortar was thoroughly dried. As the conduits are salt glazed it does not seem possible for the moisture to pass through the tile proper.



Interior of Great Court of New West Baden Hotel. The Great Columns Were Built of Common Chicago Brick and Are Very Handsome.

Mr. J. C. Rossi, general manager for the National Fire Proofing Company, has recently returned from a trip through Europe with Mrs. Rossi. Mr. R. told me yesterday that his observations on the other side showed clay of better quality than we have here, and while it cost more to manufacture brick, etc., over the pond than here, they were well made.

The improvements contemplated at Henry Maurer & Sons' plant are progressing fairly well, but much finished building material is piled up in the yards awaiting shipment.

Much sewer work is under way in Perth Amboy, and many brick are being used for this purpose.

More taste is being used in fronts of present buildings going up than formerly. The new government building now under way will be of terra-cotta and brick above the granite foundation, and, if Postmaster Tice tells me the truth, Amboy will have a beautiful as well as a substantial building when completed.

I recently visited the Avery Brick Works, at Clifford, between

South Amboy and Matawan, on the Central Railroad of New Jersey. When I last visited the plant, some three years since, the Averys were just erecting a kiln with furnaces after the Wingard style. I was surprised to see those furnaces entirely torn away and the kiln turned into a Dutch kiln. I asked Mr. Avery the reason. He said it was "dollars and cents," and we believe sense also. I have never seen better burns in red-brick yards than they have here—very few pale brick. Mr. Avery has come to the conclusion that brick should be dried before set in the kiln, and, to avoid outside yards and damp brick, they are changing this winter into another dryer system. Weather is too uncertain in New Jersey. When a brickmaker wants brick he wants them ever so bad, and with the dryers all in good shape the brickmaker is independent of the weather. Thirty million has been the small number of brick made at this plant this last year. But with the improvements now contemplated quite an increase will be made next year. Many acres of additional clay lands have been purchased, and we believe none are better situated for railroad shipments.

The terra cotta plants are now on full blast, and many men are employed in these plants. The amount of clay and sand shipped out of the Raritain district is simply immense, both by water and rail. One cannot help but wonder where it all goes to.

Building operations in Perth Amboy are still under full swing, and the beautiful weather we are now having helps matters wonderfully.

Mr. C. S. Edgar, our neighbor, is at present spending a few weeks at home in this village, but contemplates a trip to Texas in the near future. His many clay industries are moving along as usual. Mr. A. Edgar's fire brick plant is now running after a short shut-down. In fact, steam and smoke flies from every factory in this section at the present writing. W. R. O.

Metuchen, N. J.

Written for THE CLAY-WORKER.

THE OUTLOOK.—NO. 7.

WE SHALL NOW draw this series of articles to a close, and the brickmaking season will draw to a close at about the same period. Already the frosts have caused the summer yards of our northern neighbors to shut up shop, and to put matters in shape for the winter's lay-off. Already some of their hands who are of a migratory habit have put in an appearance like birds of passage on the road to the sunny south. And now, what of the outlook at this late day of the season 1904? Have we met with just such a year as was predicted in the first article of this season? Have you sold many bricks, and does the immediate demand bid fair to clean up your yard, and thus give you the cash to show for the entire season's work? Cheering reports come from almost every quarter of the nation of a good year's work and hopeful feelings for the year 1905.

There has never been a presidential campaign that has created such a small stir in financial and industrial circles. There will be no radical changes in economic laws, no matter which party may be successful. And so we are just going on with our work and permitting the political spellbinder to spellbind all he pleases, but our business is to make bricks and sell them.

Our men have never asked for a lay-off to attend a rally, and even the brass band has failed to entice them away from their work for one afternoon. And at the present writing I do not believe it would be possible to persuade or even drive one of them to join a strike. But the lateness of the season may to some extent account for their distaste for strikes. Still, I think their last strike left a very bad taste in their mouths. And then there are enough new buildings contracted to keep us going at our fastest gait until the snow falls, our only fear being that we may not be able to fill all of our contracts.

All things have worked together for good to the brickmaker, and we believe that there are better things in store for him yet. Nothing can compete with his products in quality and cheapness, and the popularity of his ware is steadily on the increase. Natural stone in some localities cuts considerable figure as a competitor, but even in the sections where the best of stone can be quarried, bricks are gaining ground against this great natural product. "As solid as stone" has long been a popular adage, but bricks rival stone in solidity. Poets have sung of the eternal rock-ribbed hills, but the truth is that the hills are gradually wasting away under the combined attacks of frost and moisture, while a good brick will not lose one ounce of its weight in thousands of years.

Much has been said of manufactured stone, and many are the devices for producing it at a cost that will put the brickmaker out of business. We do not make it a practice to decry the merits of any good thing, even if it does sometimes cut a slice out of our annual dividend. But the production of artificial stone is no new thing, and it has never been a serious competitor either with natural stone or bricks. So we fear no competitor but wood, and within a few years that will become so expensive that brick houses may be built as cheap as wooden ones.

The season of 1904 has witnessed the erection of many new plants, as well as greatly increased capacity of old plants, and still all are running at almost their full capacity and no sign of stopping until cold weather interferes. Besides, the brickmaker has almost conquered the elements. What a source of loss a heavy rain once was to the business, and a freeze meant complete cessation of operations. Now rains cut no figure, even when long and continued. And freezes are almost as harmless in many of our factories.

What a vast amount of capital has been invested in brick machinery in the last fifteen years! The field for investment during the next few years will be in dryers. The brick machine calls for improved methods of drying, and I believe that there will be just the same movement in discarding natural air dryers and adopting artificial dryers as there was in dropping the hand manufacture and taking up the machine molding of bricks. While this may not increase the daily products of many factories that have large natural air facilities, it will so increase the length of the season of production that it will result in much greater production of bricks. And still the demand seems never to be satisfied.

And now, a few words by way of advice. Stick to your brick yard. It is safe and sure if you have it in any good shape for economical operations, and have it insured against fire and cyclones. Whatever improvements you may add hereafter, make them permanent in character, and, if possible, use material for construction that is fireproof. If you have abundance of raw material, nothing is too good for your plant, and no reasonable expense can ever fail to come back to you in steady dividends. Train your boy to take your place when you are too old to get the proper move upon yourself. But if you have no boy, let your daughter marry your competitor's son, and combine the two warring concerns into one, and then raise the price of bricks for the benefit of your grandchildren. If such a combination as this is not possible, make some other that will stop the cutting of prices and enable you and your neighbor to get profits commensurate with the quality of wares you produce. Do not let the quality deteriorate, but rather give your customers better bricks during the coming season than you did in 1904. And finally, get ready to die, but put the dying off 'till the last thing, and then instruct your executor to erect a brick monument over your last resting-place. Remember, no better legacy can be left to your children than a neat brick factory, ready to run at a moment's notice, and warranted to produce the best building material yet invented by man.

For cheap machinery the reader is referred to our "For Sale" columns. We do not advise the purchase of cheap machinery. As a rule, cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted," "For Sale," etc., columns a means of satisfying their needs.

Written for The Clay-Worker.

A WORLD'S FAIR PRIZE WINNER.

The Blue Ridge Enameled Brick Company Awarded a Gold Medal at St. Louis.

THE GRAND PRIZE awarded to the Blue Ridge Enameled Brick Company by the Louisiana Purchase Exposition, will make our picture, taken by our own photographer, of the company's splendid exhibit of more than usual interest. This great enameled brick manufacturing company is located at Saylorsburg, Pa., on the line of the Central Railroad of New Jersey and had its origin in 1894 in the Pennsylvania Buff Brick and Tile Company, which was incorporated for the manufacture of front brick. The company started in a small way (as nearly all the most successful concerns do) in a one-story frame building, with a two-mold Boyd press, a six-foot dry pan and a 10,000-capacity kiln. It was soon found that there were larger possibilities in the field of enameled brickmaking. Numerous experiments were made, the services of one of the most competent experts from Leeds, England, were secured, and, after about a year's work, the enamel was made to fit the clay, the manufacture of the regular front brick was at once discontinued and it was determined to produce nothing but a high-grade, hard-glaze, mud-made enameled brick. This enameled brick was received with great favor, and the trade name by which it became so well known was soon a valuable asset. Accordingly on the 1st of April, 1901, the title of the company was changed to that of the successful product, whence we have the "Blue Ridge Enameled Brick Company."

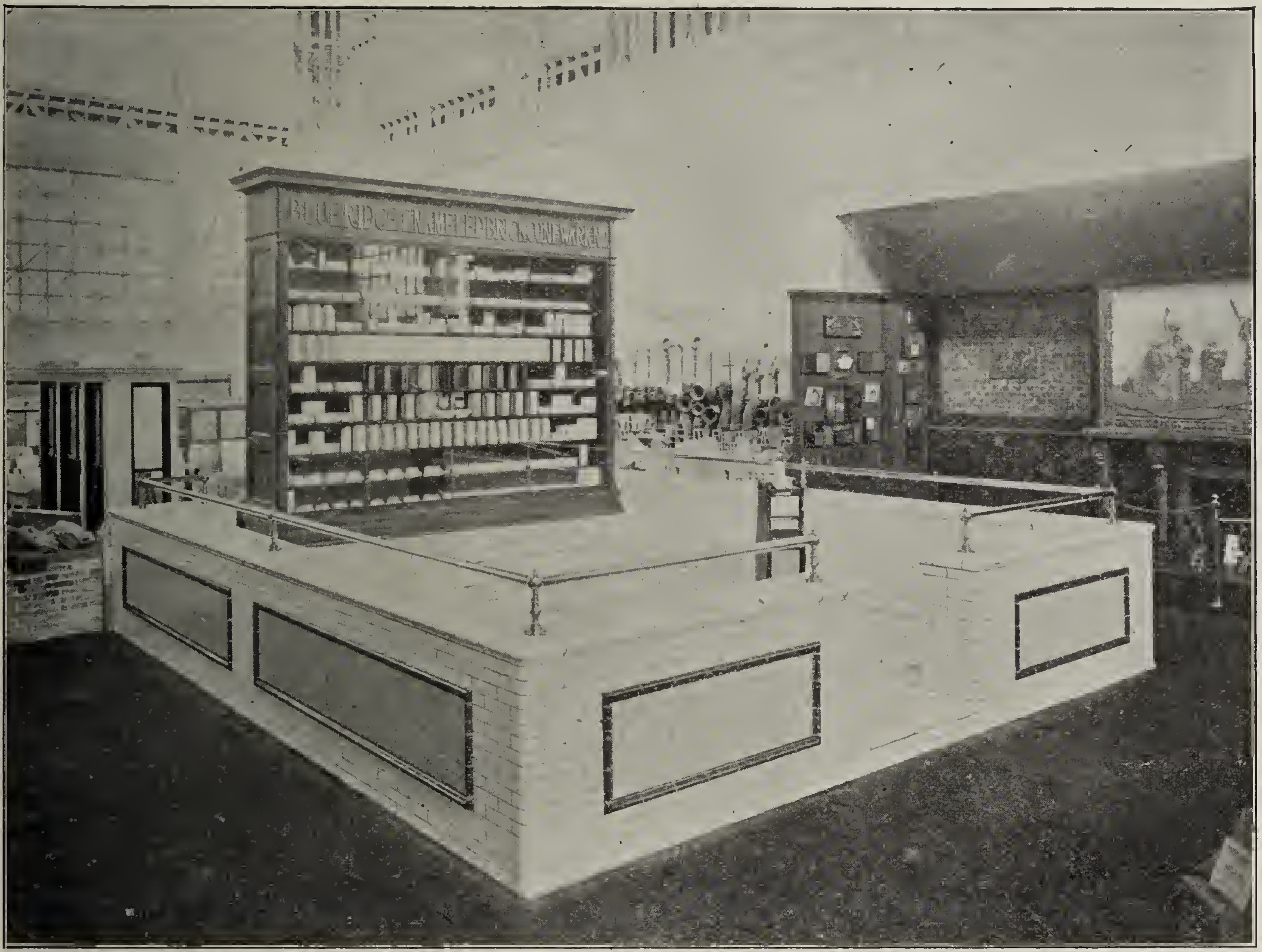


Exhibit of the Blue Ridge Enameled Brick Company, Which Was Awarded Grand Prize.

The officers of the company are: Theodore C. E. Blanchard, president; John B. Williams, vice-president; Fred C. Blanchard, treasurer; Ira M. Taylor, secretary, and William W. Blanchard, general manager. The works at Saylorsburg are under the direct superintendence of Richard C. Reynolds and James T. Rayner, for General Manager Blanchard spends about two-thirds of his time at the company's offices in the Prudential Building, Newark, N. J. The rest of his time he puts in at the works.

The actual plant covers about six acres, though the company owns clay lands to the extent of between 200 and 300 acres. In addition to this it owns the Lake House, at a short distance from the works. This is the only hotel in Saylorsburg and is quite a noted summer resort.

Some idea of the extent of the work may be gathered from the fact that, in addition to the imported clays that are used, the company gets about 75 tons per day from its own mines, whence the clay is got from a depth of 150 feet.

The enameled bricks produced by the Blue Ridge Enameled Brick Company are made in accordance with the best English methods, where the enamel is put on the green brick instead of burning the brick before dipping it. In this way there is not only an economy in burning, but when the whole is fired together it is claimed that the combination between the body and the cover is much superior, and, the enamel being suited to the body, there is absolutely no risk of crazing. The products of the company are shipped over a very wide range of territory—from Boston to San Francisco and from New Orleans to Montreal.

The award of the Gold Medal at the Louisiana Purchase Exposition was preceded by awards at the Pan-American and the Charleston Expositions.

Some of the new buildings being erected for the Cornell University, Ithaca, N. Y., absorbed over 400,000 hollow brick furnished by the Hanover Brick Co., Whippany, N. J. This is the first contract for this kind of brick executed by the Hanover Co., and it was handled so well and so expeditiously that the result has been another contract for half a million more of the same kind of brick. These brick were made on a Chambers brick machine, burned in down-draft kilns, and are of exceptionally fine quality.

Written for The Clay-Worker.

AMERICAN POTTERY AT THE WORLD'S FAIR.

POTTERY AT THE ST. LOUIS World's Fair promptly classifies itself into two groups that are as sharply defined in the exhibits as they are by the trade, or into *white ware* and *art pottery*.

In the *white ware exhibits* we have little to be proud of, with one or two exceptions. While it is true that most of our white ware potters are still contented to make only the cheaper grades of ware, and not a few are still putting the English trademarks on their goods, we have a few factories that can, and do, make some excellent decorated ware on high-grade white granite, semi-porcelain and bone-china bodies. The Greenwood, Lenox and Willetts potteries of Trenton, Knowles, Taylor & Knowles, of East Liverpool, Mayer Bros., of Beaver Falls, the Wheeling and Riverside potteries, and the Union Pottery, of Greenpoint, can produce goods that will bear favorable comparison with similar lines of foreign goods. These potteries could have made exhibits that would have been a valuable education to the general public in presenting a fine line of ware that is supposed to be only obtainable from abroad, and which the jury of awards would undoubtedly have recognized most favorably. How such an opportunity of thus most favorably impressing the public with the advances that the better American potteries are making, could be ignored and neglected is incomprehensible, especially as ample time was given to get out new lines and present fine exhibits.

The *Art Potteries*, on the contrary, have made some magnificent exhibits and have not only given just cause for Americans to be proud of their advances in this line, but have made such favorable impressions on the foreign visitors to the Exposition as to result in numerous sales to many European museums and private collections. It is true that we do not by any means cover all the lines of art pottery, and that the work of our artistic ceramists is still mainly confined to faience and majolica ware. But if the demands on the skill of the potter is moderate in producing the low-grade body of this class of ware, the color results and artistic effects are at least far superior to the hard-fired porcelains that are still the favorites of the European potters for exhibiting art and skill.

In taking up the few limited exhibits of table ware, the pottery that pre-eminently stands first and is the one bright spot in this line is the *Onondaga Pottery, of* Syracuse, N. Y. While it is not a large exhibit, it is very attractively arranged in a fine plate-glass case in a prominent position in the Clay Industry Exhibit. The exhibit consists of a series of plates decorated in blue and gilt on a soft or bone porcelain body that show excellent taste, able technique and have a beautiful finish. The body and glaze are up to the highest standard of the best European potteries, while the decorations show a delicacy of taste and a refinement in treatment that clearly demonstrates that at least one American pottery can produce results equal to the best European in the highest grade of table goods.

The new *Pope-Gosser Pottery*, of Coshocton, Ohio, exhibits a small line of plain and decorated table ware in the Ohio exhibit, that augers well for the future of this concern. The body is a semi-porcelain of considerable merit, while the shapes and decorations, though conventional, show careful treatment.

Ohio also exhibits a case of sample plates from several Ohio potteries that reflect more credit on the enterprise of the Ohio commissioners than the potteries represented.

The Edwin M. Knowles China Company, of East Liverpool, makes a limited exhibit of their semi-vitreous table ware in two styles of decoration. The treatment in their decorations, while not original, is good and the quality of the ware is excellent, so that one regrets that such a firm does not show a more complete exhibit under their own name than as an adjunct to a clay machinery exhibit.

The *Mayer Pottery,* of Beaver Falls, Pa., makes a very interesting exhibit of its under-glaze semi-vitreous table ware in the Pennsylvania exhibit that is especially instructive to the layman. It shows a full line of the raw clays, fluxes and colors, the biscuit ware, the saggers, and, finally, a series of the finished goods. It is well labeled and so arranged in sequence as to admirably illustrate the complicated art of the potter. The composition of the body is admirably shown by a series of scaled cubes that give flint 35.5 per cent., china clay 28 per cent., ball clay 22.5 per cent., and feldspar 14 per cent, as well as the Seger cones, by which the body and glaze are burned. The quality of the Mayer goods is very encouraging and again brings regret that a more complete exhibit has not been made by this intelligently managed pottery.

The *Owens China Company,* of Minerva, Ohio, exhibits two sets of table ware decorated with over-glaze prints on a white granite body, and show a few excellent samples of under-glaze decoration on a vitreous body.

Display of the Malvern Clay Company.

The State of Missouri, in the Varied Industries Building, exhibits four large cases of hand-painted decorated ware that is largely the work of amateurs scattered throughout the State. It is all over-glazed work, and while some of it is very good, most of it has little merit to interest the potter or discriminating public.

In *electrical porcelain,* several exhibits are made by the American potteries which include the Hartford Faience Co., Pass & Seymour, of Syracuse, the High Voltage Insulation Co., of New Lexington, Ohio, and the Brunt Pottery, of East Liverpool. Some of these electrical exhibits show decided ingenuity in successfully producing some very complicated shapes, while the bodies are good; but they also seem to have been too busy or not sufficiently interested to make very complete or attractive exhibits.

The Trenton Potteries Company, of Trenton, N. J., make a very fine exhibit of a full line of sanitary goods in the Manufacturing Building, and in conjunction with the Trenton Tile Company show two model bathrooms that are equipped and furnished exclusively in white ware. Not only are the floor and walls finished with white tiling, but also the ceiling, while the handles and other trimmings of the plumbing are made of vitreous china. These two bathrooms are beautiful examples of the most advanced work in this line, and are very flattering to the designer and manufacturer. The white finish of the entire room not only gives it a thoroughly sanitary aspect, but blends a most attractive and inviting charm by its cleanly atmosphere. While naturally the expense of such a magnificent bathroom is considerable, the harmony, appropriateness and beauty of such fine sanitary goods should make it appeal very strongly to those who can afford the best. One of the bathrooms is treated exclusively in white, while in the other a slight amount of gilt decoration on the wainscoting relieves the monotone. The N. O. Nelson Company, of St. Louis, in an adjoining exhibit, presents some more of the Trenton sanitary goods in connection with the U. S. Encaustic Tile Company that are treated quite differently, as the floor is worked out in a mosaic pattern of fill, while the ceiling is highly embellished with decorative art-tile.

The Trenton Potteries Company also exhibits four magnificent specimens of art vases that are nearly five feet high. They have a vitreous body and on a dark blue under-glaze background some very beautiful art work in over-glaze colors has been rendered in the form of landscapes that make these vases very creditable exhibits of what this pottery can do. It is needless to say that the Trenton Pottery people captured the grand prize for their most creditable exhibit.

In taking up the *Art Potteries*, the Grueby Faience Company, of Boston, has won the grand prize for a very fine exhibit of wall tiling in their characteristic matte green under-glaze finish. In the center of an extended wall is a simple but very attractive study of a few trees that are so paneled with tile of different shades as to make a very effective center-ground. On each side are two fireplaces that show how very appropriate the Grueby tile is for domestic architecture to those who wish to combine an artistic home with a thoroughly durable, cleanly and fireproof finish. With this masterly tile study, Mr. Grueby shows a very complete line of his familiar art pottery in the form of vases, jardinieres and lamp stands that still follow the simple lines and soft green matte glazes that are synonymous with Grueby ware. Mr. Grueby's exhibit captured the grand prize, though their location as regards the light is far from satisfactory to show it to advantage.

The Gates Pottery Company, of Chicago, exhibits three quite different lines of art pottery, to which has been given the name of "*Teco*" ware. The early work of this pottery followed in the footsteps of Grueby in using a soft matte green glaze on well-designed vases and lamp bodies. This seems to be the principal line followed by this pottery, as judged by its predominance in the exhibit, and while the Grueby idea is closely followed, some very attractive and original shapes have been developed. The Gates people also show some brilliant samples of high-glazed, richly-colored faience, in some of which the gold stone effect is very handsome. The latest development of this pottery is the crystallized type of decoration, of which some very beautiful specimens are shown in neutral colors. While this type of decoration may never become popular, it is at least novel in this country, and some of his better studies will bear favorable comparison with the magnificent display made by the Sevres Pottery, in the neighboring French Government Building.

The Gates Pottery also exhibits some huge vases in their exhibit in the Mining Building that are speaking samples of the ability of this pottery to do very bold large work. In this latter exhibit they also present a landscape painting in which the color effect is obtained by slips on a terra-cotta panel. As this gives the painting the same soft character as an oil painting without the non-enduring character of the latter, it opens up a very inviting field to the artist and the ceramist. Unfortunately only one specimen of this slip painting is exhibited, so that it gives one only a limited opportunity to value the field that it can cover, but it is certainly one of the most valuable suggestions and novel exhibits at the St. Louis Exposition. This latter won the gold medal for Mr. Gates, while his Teco ware was given the grand prize.

The *Van Briggle Pottery*, of Colorado Springs, makes its initial appearance before the public at an international exposition, and it is a prodigy that starts out very encouragingly. It exhibits one of the finest series of matte glaze goods ever shown and which cover almost every range of colors, or through the grays, blues, greens, yellows, browns, reds and pinks. The texture of the surface is very soft and appealing, while the colors are very effective and attractive. A series of shades ranging from carnation red to light pink is especially striking and handsome. While the treatment is largely in monotones, there are some examples of polychrome effects also presented, and to advantage where combined with relief decoration. The lines of the Van Briggle pottery follow the Grueby idea to a large extent, or depend mainly on effective outlines, combined with only slight and simple relief decoration. While Van Briggle undoubtedly got his inspiration from the Grueby Pottery, he has carried the idea much further forward and over a large range of colors, while he uses a better or much closer stone-ware body. It is indeed sad that just as this magnificent exhibit was completed the originator died, but fortunately the public has been given this splendid opportunity to witness the success of his recent efforts.

World's Fair Exhibit of the Fulton Fire Brick Company.

The grand old *Rookwood Pottery* shows that it is still immeasurably in the lead in the art pottery work of not only this country, but is still in a class quite by itself as regards the world of faience. The Rookwood people have not only made the largest and finest exhibition this pottery has ever presented, but it also shows the healthy growth and advancement that has always been characteristic of this world-famous pottery. The rich, beautiful ware originally entitled "Rookwood" that is so famous for its rich brown colors, brilliant luster and effective under-glaze decoration shows the most important step forward in now apparently being free from crazing. While this seems to have been attained at a slight expense in the brilliancy and depth of color, so many samples are exhibited that are free from this supposed inherent defect as to alone make this exhibit epoch making. If Colonel Taylor has mastered this difficulty, of which the evidence seems so strong, he is entitled to the greatest credit and is to be warmly congratulated on his success in finally eliminating this ware defect. Amid a beautiful series of the well-known type of Rookwood art vases, is a large vase in the "Tiger's-Eye" type of decoration that is a Kohinoor or a gem that defies duplication. It is a most beautiful, masterly example of this brilliant polychrome type that should be finally preserved in the Metropolitan Museum of Art.

While it is valued at only $1,000, as compared to $7,000 that Mr. Morgan gave for his famous Peach-Blow vase, it is a vastly superior work of art and a triumph of American ceramics.

The Rookwood people exhibit an interesting line of the *"Iris"* goods which, strangely enough, have never been popular in this country. While it is true the Iris goods are cold when compared with original Rookwood type, they are made on a higher grade body that is free from crazing, and some very beautiful art productions have been developed in these goods in both the blue and the green shades. Some excellent bits of green matte glazed pottery is shown, as the Rookwood people seem determined to furnish the world with all the varieties of fine faience ware, but it seems unfortunate that they should fritter away their efforts in a field that has so little novelty. Some beautiful paintings on tile are exhibited by the Rookwood people, as well as some very attractive studies in architectural faience, a new line of work that the Rookwood people have only lately taken up.

The most striking and beautiful of the Rookwood exhibits is the new *"Vellum"* ware, which for softness of colors, richness of decoration, and daintiness of detail quite eclipses all their previous efforts. It has a soft matte surface over the most delicate and artistic under-glaze decoration, and as it is developed on a high-grade, closer body the ware should be free from crazing. This *"Vellum"* ware has an irresistible charm that promises, when it is better known, to become even more popular than the high-class brown ware that made this pottery famous. The magnificent work of the the Rookwood pottery and the great advances it has made since its famous Chicago exhibit, won two grand prizes and several gold medals from the jury of awards.

A Section of the Brick Pavement on the Model Street.

BRICK PAVEMENT ON THE MODEL STREET.

Our view of the piece of brick pavement on the model street is in front of the Kansas City Pavilion, a spot that will long remain in our memory as the gathering place for the members and friends of the N. B. M. A. for that great hurrah night on the Pike. While the traffic on the Model City street can not be said to be very heavy, it is quite heavy enough to show the differences in durability of the various pavements. The vitrified brick pavement, as a matter of course, shows the best of all. The pavement upon which our camera stood presents a very different appearance from the brick pavement, while if we had taken the view from the other end of the strip of brick and stood upon the asphalt there would have been seen some telltale depressions and furrows there too. There are two blocks of brick pavement on the model streets, one laid by the Purington Paving Brick Company, Galesburg, Ill., and one, the subject of our photograph, by the St. Louis Hydraulic Paving Brick Company, and both have stood the wear of traffic without the least injury.

OF INTEREST TO POTTERS.

Mr. W. P. Jervis, who is perhaps best known as a writer of pottery literature, has for the past year been experimenting in its manufacture, and has perfected a matte glaze of much beauty. Amongst others who have seen and admired it may be mentioned the well-known connoisseur, Mr. Louis C. Tiffany, who pronounced it the best he had ever seen. Unlike other matte glazes, the one evolved by Mr. Jervis is not merely a self color, but is a rich gradation of tones, or harmonious color effects in green, gray, blues, ivory, etc. Mr. Jervis has arranged with the Rose Valley Society, of Moylan, near Philadelphia, Pa., to continue its production there, and it will be in future issued marked with their seal, in itself a sufficient guarantee of its worth.

Written for The Clay-Worker.

POTTERY NEWS.

BUSINESS WITH the potteries in this vicinity has been picking up steadily until nearly all of the plants are now busy and a good month is looked for; in fact, the present rush will now keep up until January 1. The following notes will tell what the majority of the plants are doing.

The Harker Pottery, who recently completed some large additions to its plant in this city, is erecting another large building, which will be used exclusively as a decorating department. The company reports a good business, with a good outlook for the new year.

The Homer Laughlin China Company, of this city, is erecting a six-story warehouse at their No. 1 plant in this city, which will increase their facilities for handling their ware wonderfully.

The Potters' Co-operative Company, of this city, is installing some new machinery in its pottery in this city. The new installations will be placed in operation this week.

The Akron China Company, of Akron, O., is installing some new machinery in their pottery in that city.

The Wellsville China Company, of Wellsville, O., is about to get out a new dinner service, which will be placed upon the market the first of the new year.

Patterson Brothers' Pottery, at Wellsville, O., is adding one new kiln to their plant in that city. They now have a four-kiln plant, which they run exclusively on yellow ware.

The C. W. Stine Pottery Company, of White Cottage, O., is contemplating the erection of another pottery in their city this coming spring.

The Star Stoneware Company, of Crooksville, O., are about to erect an addition to their plant in that city, and will install machinery with which to manufacture large size stoneware. The new additions will be made immediately.

The Crooksville China Company, of Crooksville, O., report the year now passing as being very good for them, with an excellent demand for their goods. They anticipate a good year for 1905, and, if this is true, may possibly erect another kiln.

The plant of the Bradshaw China Company, of Niles, O., was almost destroyed by fire last month, entailing a loss of about $20,000. They are rebuilding and have continued operations, and will soon be in a position to start up in full again.

The Artistic Porcelain Company, of Trenton, N. J., has been incorporated, with a capital stock of $25,000. They have a plant on Chambers street, Trenton. The incorporators are G. V. Sharley, F. W. Allaire and L. B. Granniss.

The Orrville Pottery Company, of Orrville, O. has been incorporated at Columbus, O., with a capital stock of $100,000, and will erect a pottery plant with a capacity of either five or six kilns at Orrville, O., immediately. The incorporators are F. J. Knapp, Robert Davenport, J. P. Madigan, Z. T. Armstrong and William Weil. The plant will be erected immediately.

Burgess & Co., who erected a large stilt works at Wellsville, O., about a year ago, but which they have never started up as yet, announce that they will make a start at the new plant on or about January 1. The plant has a capacity of two kilns, and is about the best plant in the country.

Mr. Thomas Worcester, East Liverpool, O., has purchased the plant of the Keswick China Company at Fallston, Pa., and will start same immediately. The plant has not been in operation for about two years. Mr. Worcester intends to start up immediately, having already ordered all his raw materials. Mr. Worcester is a practical potter and was connected with the same plant some years ago.

The Union Potteries Company has started work upon their new plant at Huntington, W. Va. The plant will have a capacity of seven kilns and will be modern throughout. The kiln builders will start work upon the kilns next week, and the entire plant will be rushed through to completion as rapidly as possible.

Interior of the German Court, Varied Industries Building, World's Fair.

The National Tile Company of Anderson, Ind., contemplate extensive improvements at their works in that city.

The A. Radford Pottery Company, of Clarksburg, W. Va., will add two additional kilns to their present equipment, which will give them a total capacity of four kilns and one decorating kiln. The company is experiencing a very nice run on their line of goods and report a good trade.

The Crown Potteries Company, of Evansville, Ind., contemplate the installation of additional machinery at their works in that city, and it is likely that the new installations will be made at once.

The Mosaic Tile Company, of Zanesville, O., are erecting two more large additions to their works there, and will install several new machines. They will enter into the manufacture of enameled tile also along with their regular line of mosaic and floor tile.

It is reported that another pottery will be erected in the near future at Minerva, O., by the Owen China Company, of that place. The new plant will have, if erected, a capacity of five or six kilns.

The Craven Art Pottery Company, of East Liverpool, O., have been incorporated, with a capital stock of $10,000, by Leonard Forester, W. B. Hill, A. M. Fink, M. A. Sutton and A. L. Cusic. The company operate a small art pottery in that city.

Ransbottom Brothers, of Roseville, O., are now occuping the new addition to their plant there. The size of this plan thas been greatly increased during the last year.

The Locke Insulator Manufacturing Company, of Victor, N. Y., will shortly increase the capacity of their plant in that city by the erection of two additional kilns to same. The capacity of this plant has been greatly increased during the last year.

East Liverpool, O., November 8, 1904. Tom Potter.

TWENTY-FIVE MILLION BRICKS.

Good progress is being made with the erection of the new War Office in Whitehall, England. To give an idea of the immense size of the building in which the official military work of the empire will in the future be carried on, it may be mentioned that the structure, when finished, will contain 400,000 cubic feet of worked Portland stone and 4,000 tons of steel (all English manufacture), while no fewer than 25,000,000 bricks will have been utilized. Each face of the building presents a stone facade in English classic style, harmonizing with Inigo Jones' great banqueting hall, near which it stands. The courtyard, to be approached by a fine archway in Horse Guards avenue, and designed to give light and air to the internal portion of the new War Office, is also faced with stone. Generally speaking, the plan of each floor consists of a spacious corridor, which environs the building, and on each side of which are various chambers, light and air being obtained by means of large areas lined with ivory-white glazed bricks. The site is a parallelogram, each of the four sides having a full street frontage. There will be an entrance on each of these sides, with separate staircases, and the main one, approached from Whitehall, is to be of marble. Altogether the building will be in every way worthy of the purpose for which it is intended.—Brick and Pottery Trades Journal.

GERMAN COURTYARD.

Our view of a portion of the surpassingly beautiful German display at the Louisiana Purchase Exposition shows a corner of the open court with the fountain in the center in the Palace of Varied Industries. This fountain is of tile by K. Kornhas, Karlsruhe, Grand Duchy, of Baden, Germany. He was awarded a gold medal for his exhibit by the jury on ceramics. The court is paved with excellent hard, vitrified tiles, of a dark red color. These are from the Marienberg Mosaic Tile Works,, Marienberg, Germany. The Marienberg works received an award of a bronze medal.

THE YEARLY MEETING OF THE ILLINOIS CLAYWORKERS.

The twenty-seventh annual meeting of the Illinois Clayworkers' Association will be held at Champaign, Ill., January 10 and 11, 1905.

The headquarters of the Association will be at the Beardsley, where splendid quarters have been secured. This hotel has just been enlarged and remodeled, and can easily accommodate all members.

A banquet given by the brick manufacturers and citizens of the city will be one of the features of the first evening. All members displaying badges will be given free transportation on all car lines during the entire meeting.

A very interesting programme has already been assured.

F. W. Butterworth, President.

G. H. Hartwell, Secretary.

Written for THE CLAY-WORKER.

NORTHERN OHIO BRICK SITUATION.

THIS SEASON HAS BEEN a most extraordinary one for the manufacture of brick. The weather was of the most favorable kind throughout the entire summer and fall. On the other hand, Toledo brickmen in general report rather light business for the season.

With the advent of the month of November all the brick plants were found closed down for the winter with but two exceptions—the Ohio Brick Company and the Findlay Hydraulic Pressed Company, having plants equipped with Standard dryers, are enabled to be in operation the entire year.

"There is little to say in the way of encouragement on the brick situation in Toledo," said W. O. Dakin, secretary of the Toledo Brick Supply Company. "All the plants have been kept running until the yards became filled up, and that is the condition you will find them in to-day. While the weather has been fine all season, the demand from the outside for Toledo brick has not been quite as strong as the year before. Therefore, you find a larger reserve stock on hand at this time than in November of last year. There has been no change in prices; in fact, there has been no occasion for such a thing at this time of the year. Buyers cannot be induced to buy brick now, even at a marked reduction in price, and store them away over the winter. To cut prices now would be like a fur store making a cut on furs in July to get rid of stock."

"The building season is just about over," said Richard Kind, secretary of the Toledo Builders' Supply Company. "Practically all the contracts to be let this season are now awarded, and now there is a general hustle to finish up. Business in the spring was late in getting started, in view of the long and severe winter season. On the other hand, the beautiful weather of a late fall has enabled contractors to do a great amount of work during October. Taking a conservative view of the coming year, it is my opinion that the prospects are for big business and great building activity."

During the past year there have been a large number of flat buildings erected. Toledo was rather slow in coming to the needs in this line, but the record of the past year shows that investors have found a very profitable place for the investment of their money in the erection of flat buildings. There are a goodly number of new flat buildings in contemplation, and next year will see wonderful activity along this line.

An even hundred building permits were taken out during the month of October. Of this list 84 were for new structures, leaving 16 for additions and alterations.

Next season there is to be erected in Toledo one of the largest and handsomest office buildings to be found anywhere between New York and Chicago. The structure is to be called the Nicholas, and will be sixteen stories high and contain nearly one thousand offices. Pressed brick is to be used almost exclusively, and the trimmings will be in terra cotta. Mosaic style of architecture will enter largely into the construction of the hallways. White Italian marble will also beautify the walls of the halls for seven feet from the floors. The size of the building will be 130x120 feet. The height of the first floor will be 13 feet, the second 12 feet, and the remaining fourteen floors 10 feet, these being the net distances between the floors and the ceilings. The total height of the building will be 215 feet. The lower part of the building will be an arcade style of architecture. Six passenger and one freight elevators are also included in the plans. There will be two large grand entrances. There will not be a dark room in the entire building, as every one is to either receive light from the outside or from the court within. The first two floors will be of mahogany, the remainder of quarter-sawed oak. The building will be equipped with its own electric light plant, and all wires are to be run through conduits. The cornices will be of copper in the Green design, the first two floors to follow very closely the Greek style of architecture. The building will be erected by the Nicholas Building Company, all the stock of which is held jointly by Gen. C. M. Spitzer and A. L. Spitzer. They are the present owners of the Spitzer building, which contains between 700 and 800 offices and shops.

The W. G. Nagle Electric Company has decided to erect a new four-story building, which will cost in the neighborhood of $40,000. The plans have been drawn by Architect L. G. Welker, and the contract has been let to R. Hattersley. The building is to be completed by May 1, and is to be constructed of pressed brick.

Architect Link, of Pittsburg, is drawing preliminary plans for a union depot for the Wabash Railroad in Toledo. The structure will cost in the neighborhood of a half million dollars, and will be used by seven roads. Pressed brick will enter very largely into the construction of the building.

The German Lutheran Church has decided to erect a home for aged people on the East Side. About $15,000 will be expended in the erection of a suitable building. Rev. William Wacke is treasurer of the committee appointed to secure the funds. Brick will enter largely into the building of the structure.

The Gendron Wheel Company is having plans drawn for the erection of a large addition to the Superior street plant. Brick will be used.

A three-story business block is contemplated by J. W. Close, of Bellevue, O., on his Toledo property on Superior street, at the rear of the Blade building. The structure will be erected of brick, and is estimated to cost about $20,000.

The St. Mark's Episcopal Church just recently took out a building permit for the erection of a new stone and brick church to cost $44,000. The structure will be 107 feet wide, 113 feet deep and 60 feet high. The H. J. Spieker Company has the contract.

Peter Bauman has the contract for the erection of a modern brick flat building for John F. McKenna at the corner of Monroe and Twenty-first streets. The building will be three stories high, accommodate six families, and will cost about $20,000. The size of the building will be 62x42.

George G. Metzger has decided to have two large flat buildings erected at the corner of Linwood and Woodruff avenues. The plans are now being drawn and the cost of the structures is estimated at about $75,000. One building will be 100x130 feet in size, the other to be 130x66 feet in size. It has not yet been decided whether the structures will be three or four stories, or whether they will be erected of brick or concrete blocks. The flats will accommodate thirty-five families.

It is planned to erect a brick addition to the Jefferson Hotel. The addition is to be 60 feet wide and 120 feet deep and contain 125 rooms.

The big Valentine building is to be converted into a hotel, and $150,000 will be expended in remodeling the pressed brick structure. Two more stories will be added. The house will contain 250 rooms.

A four-story brick flat building will be erected on Scottwood avenue, near Bancroft street, for Eugene McFall, of Sandusky, O. McFall has just recently purchased the lot, which is 72 feet wide and 220 feet deep, on which the big apartment house is to be erected this year yet.

Milton Taylor has brought suit against Charles G. Ziegler to foreclose a mortgage for $983.86 on the Ziegler filter and pottery plant.

A few contracts for street paving have been let during the past few weeks. The contracts are small and are to be completed as soon as possible.

Greiner, Geb & Co., brick manufacturers at Ottoville, O., have been succeeded by Greiner Brothers.

A city building is contemplated at Monroe, Mich. If the present plans materialize, the building will be constructed of pressed brick and stone, will be 100x80 feet in size, and will cost $24,000.

W. J. Smith, of Toledo, is erecting a brick and stone church for the Baptists at Bucyrus, O.

Charles A. Foster, aged 29 years, a stockholder and bookkeeper for the Fremont Pressed Company, at Fremont, O., died the latter part of last month.

T. O. D.

Written for The Clay-Worker.

WITH THE PHILADELPHIA BUILDERS.

LESSONS taught by recent disastrous fires, notably that in Baltimore last February, have been taken to heart by owners of property, architects and builders, and as a result terra cotta fireproofing is being very generally used in the construction of new buildings in this neck of woods, as well as for the protection of old ones from destruction by fire. The fact that the use of this material means a saving of from 40 per cent. to 80 per cent. in insurance rates has contributed not a little to opening the eyes of owners. The insurance companies give a flat rate on buildings fireproofed with terra cotta, whereas they penalize other kinds of construction to the degree referred to above.

Among the large and important buildings now under construction in this city in which this method of fireproofing is included in contracts are the new Nurses' Home at the Women's Hospital on North College avenue, in which all five floors, all partitions, columns and girders are to be of terra cotta fireproofing material; a large addition to St. Agnes' Hospital and an isolating ward for the same institution at Broad and McKean streets; the new Jefferson Medical College Hospital, under construction at Tenth and Sansom streets, which is to cost about $1,000,000; the engineering building at the University of Pennsylvania; the new maternity ward for the Presbyterian Hospital, Thirty-ninth street and Powelton avenue. For all of these Henry Maurer & Son, whose extensive plant is located at Maurer, N. J., near Perth Amboy, on the Pennsylvania Railroad, have contracts. The same firm's material has been used in a large warehouse for the War Department at the Schuylkill Arsenal, Twenty-third street and Gray's Ferry road; an extensive addition to the Provident Building, Fourth and Chestnut streets; the new medical laboratories at the University of Pennsylvania, and the house for nurses at the Protestant Episcopal Hospital, Front street and Lehigh avenue.

Maurer & Son are also about to begin the installation of their terra cotta fireproofing in the new university building now under construction in Burlington, Vt., a point of peculiar interest about which is the size of the spans, which range from 19 to 21 feet 6 inches, and are reinforced with T-irons. Approximately there will be about 75,000 square feet of fireproof flooring and 10,000 square feet of partitions in this building, in addition to that necessary for columns and girders. The same firm's terra cotta fireproofing is being extensively used in the construction of car barns all over the country. The walls are of 4-inch terra cotta, with pilasters of the same material every 16 to 20 feet, and the roofs are of tiles, also the product of the Maurer plant.

As explained by Mr. John Stahr, manager of this firm's Philadelphia branch, the reasons advanced by the various trolley companies for the construction of their barns of terra-cotta is that they are able to place insurance on their rolling stock at a much lower rate than has ever been possible when cars have been stored in barns of any other construction. All the buildings of the Barber Asphalt Co., near Perth Amboy, N. J., are constructed of fireproof materials manufactured by Maurer & Son.

Another point in connection with terra cotta fireproofing is that the brewers throughout the country have discovered that it forms perfect insulation for the ceilings of their fermenting rooms. It is used exclusively by Mr. Otto C. Wolf, the well-known brewery engineer of this city, who is now designing a large brewery to be erected in Pittsburg, in which terra cotta fireproofing will be used exclusively.

Mr. Stahr reports that the demand for clay products manufactured by his firm has been so great this season that the factory, large as it is (it covers about 50 acres), has been unable to keep up with it. QUAKER.

The machine which does not answer your purpose may be just what some one else needs. Tell the "needee' about it in a card in the "For Sale" columns of The Clay-Worker.

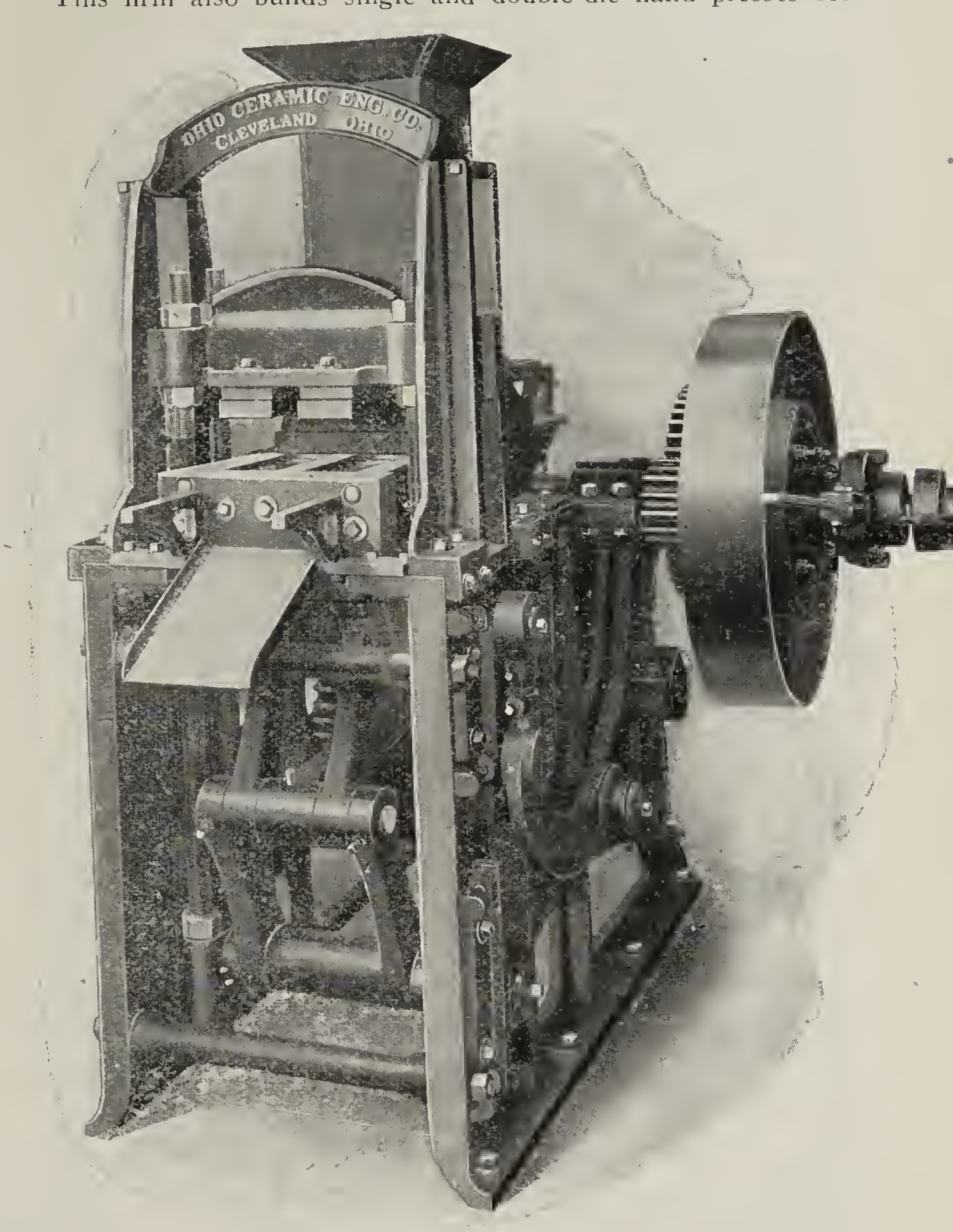
A NEW POWER PRESS FOR SAND-CEMENT BRICK.

The Ohio Ceramic Engineering Company, of Cleveland, Ohio, has recently placed on the market a new double-die power press especially built for making sand-cement brick. They inform us that they have several of these presses in successful operation, and that they are giving satisfaction.

The material is fed into the dies of press from a hopper, in much the same way as it is done in dry press machines, and brick are discharged onto pallets, resting on brackets on front of press, ready to be taken away for curing.

The press appears to be substantially built, and it has a very nice, easy movement. It is compact and self-contained, requires but a small floor space, and surprisingly small amount of power to drive.

This firm also builds single and double-die hand presses for the same purpose which work on much the same principles.



New Double Die Power Press for Sand-Cement Brick.

The Ohio Ceramic Engineering Company are well known in the trade as designers and builders of presses, and have the reputation of standing by anything they build.

NEW COMPOSITIONS FOR FLOORING.

A German invention deals with the manufacture of plastic compositions for flooring purposes. Ash, moistened with a solution of sulphate and chloride of magnesium, is mixed with kaolin, or clay, and talc; gypsum and magnesite are then added. The mixture is stamped and rolled in place while cool to form the bed of foundation of a jointless floor. When the bed has hardened, a surface layer composed of asbestos and sawdust moistened with magnesium, sulphate, and chloride and mixed with kaolin, or clay, and talc, gypsum, and magnesite is applied.

CORRESPONDENCE.

These columns are open to all. The full name and address is required, but will not be published except when permission is given. Those desiring to communicate privately with any correspondent whose full name is not given can do so by addressing letters care of Clay-Worker.

A Successful Nebraska Plant.

Editor Clay-Worker:

We sent you $2.00 for our subscription to The Clay-Worker some few weeks ago, and we find your magazine very beneficial.

We started in Columbus one year ago, and this season's output will be two million and a half of brick, for which we have a ready sale, at from $7.00 to $9.00 per thousand. We are now contemplating enlarging our plant to the capacity of 35,000 per day, and also start another yard at Schuyler, Neb.

Karr-Nichols Co.

Entire Output Sold a Month Before Closing Down.

Editor Clay-Worker:

Enclosed please find $2.00 for one year's subscription to The Clay-Worker, which is a very valuable help to me in the brick business and should be subscribed for by every brickmaker in the business. I have had a very busy season, my whole output being sold one month before I closed down. My plant is located two miles outside of the capital. I manufacture with a Hercules soft-mud machine, which molds almost a perfect brick. I have a yard capacity of the rack and pallet system of 25,000 per day. I have just completed building one of Cornell's down-draft kilns, which burns 95 per cent. all hard brick. T. M. Mulligan.

Ontario.

Machine Plants Supplanting the Hand Yard in Virginia.

Editor Clay-Worker:

I have received the Post Fountain Pen, ordered recently in connection with my subscription, and am more than pleased with it.

The brickmakers in this section are as busy as they can be, they are fairly making the dust fly. Nearly all of them are changing their yards from hand yards to machine yards. With one exception, machines have never been used here before. That one exception was many years ago, when a machine was installed and broke down after having been used but a short time, because the man who owned it did not know how to run it. I want to give a little advice right here to the machine men. When selling a machine, particularly in the South, they should always send a competent man to see that the machine is started right. In the case mentioned, the machine was all right, but it was not operated right. Since the machine fever struck this section, J. C. Steele & Sons, Statesville, N. C., have fitted up two yards with stiff mud machines, and J. D. Fate & Co., Plymouth, Ohio, have fitted up another yard, and all of them are doing fine. It was late before the machines were put in, and now they are running them to full capacity to lay in a stock for spring trade. Between now and spring more of these stiff mud machines will be put in the yards. These stiff mud or auger machines seem to be well adapted to the clay, and it seems easier for the class of laborers here to operate them than any other machine. Wm. Turner, Bristow & Harrison and the Swift Creek Manufacturing Company have all put in machines.

There are no very large brick plants in this section, but there are a great many small plants making by hand, and I think it would be a good idea for some of the machinery firms to send down a good agent, with some samples of the brick or some other clay product made by machine. I can remember when there were no machines in this section, when all brick were made by hand, but the brick men are progressing, and the machine man is making improvements in his machine, and it will not be long until the hand yard in this section will be a thing of the past.

Chesterfield Co., Va. J. S. S

The Clay-Worker an "Ever-Welcome Visitor."

Editor Clay-Worker:

I have been away from home a great deal this summer, just having returned from Kenmare, N. D., where I built a six-track Barron dryer for the Kenmare Hard Coal Co. I also built a six-track dryer at Tampico, Mexico, for the Ugarte & Janregus Co. Business just at present is a little dull. Mr. H. C. Brown, of Harmony, Ind., is figuring on starting a plant at Vandalia. Enclosed find check for $2 for the ever-welcome visitor, Clay-Worker. W. D. G.

Albion, Ill.

Possible Opening for a Good Man in a Georgia Dry-Press Brick Plant.

Editor Clay-Worker:

Enclosed find check for $2 to cover subscription to Clay-Worker. We thank you very much for your courtesy in this matter and beg to assure you of our high appreciation of The Clay-Worker and the many items of interest in it. In addition to all this we wish to thank you for the kind assistance you have been to us on several occasions in giving us addresses and information asked for. We might be in the market some time in the near future for the services of a man who is familiar with a small dry-press plant and could take charge of it, being able to handle negro labor, know how to handle the clay properly, and have some idea of burning, although he would have under him a man thoroughly familiar with that, and who is also able to properly shade brick from the kiln to the stock pile.

Jackson & Phelan.

Wood or Coal, Which?

Editor Clay-Worker:

As a subscriber to The Clay-Worker, we would ask that you kindly advise us, if possible, what difference there would be in burning brick with good maple and beech wood or with coal, and which would be the cheapest, coal or wood? Also kindly inform us if coal at $3 per ton would be cheaper and give better satisfaction than good hard body wood at $1.75 per cord.

We would thank you to get us opinions on this matter through your paper, as well as to give us your own experience.

Traverse City Brick Co.

The Voice of Experience.

Editor Clay-Worker:

The above is a practical question, but one impossible to answer with scientific accuracy. A cord of wood is a very uncertain and variable quantity as to weight and caloric value.

It has been found that air-dried wood contains 3,000 to 3,200 calories and that bituminous coals vary from 7,500 to nearly 9,000 calories, the Hocking Valley having 7,925, the Pittsburg 8,435 and the Pocahontas 8,749 calories. It is safe to say, however, that the available heating power of air-dried wood is not more than 25 per cent. of that of coal, weight for weight. Hence, assuming that a cord of dry maple and beech weighs on an average two tons—beech might be a little less and maple a little more—one cord of wood would equal in heating value one-half ton of coal.

These calculations would make the coal at $3 per ton more economical than wood at $1.75 a cord, but it does not follow that in this inquirer's case it would be more profitable to use coal than wood for burning their brick. They may have none but the common clamp kilns, with no furnaces, firing the fuel in the arches. In this case wood may give the better results. To get the best results from coal they should have good, permanent furnaces—not necessarily patent furnaces, but furnaces designed by a competent engineer and adapted to their special conditions, the character of the coal and of the clay to be burned, kind of kiln, etc.

There is an advantage in coal in that a large supply does not have to be kept in stock, and hence the advance investment in fuel is less, and also that the space occupied on the yard is much less. On the other hand, if proper furnaces are not provided the results may not be as good with coal, the arch brick not as good, nor the color of the brick. Probably with their present equipment and their experience in burning with wood, it would not be advisable for this inquirer to change to coal, though a thorough investigation by a competent engineer is the only means I know of to obtain a reliable basis for action in the matter. R. I. C.

Will Build a Continuous Kiln.

Editor CLAY-WORKER:

Yours of the 20th received and contents noted. I promised after leaving you at St. Louis to let you hear from me, but have been too busy since returning. I went to Ottumwa and saw a continuous kiln there—one of Dunn's, having twenty-two chambers. From there I went to Omaha and Sioux City. There were several large plants at the latter place and a great number of continuous kilns, one, I believe, of our friend, Mr. Haigh's, and several after the style of Sercombe. After getting home we decided to build one and adopted the Dunn. We are having one built with twenty-six chambers, 42 feet long inside, which means about 45,000 in each, or about 1,200,000 in the kiln. Business is good, and except for a strike in Toronto would be a record year.

Don Valley, Canada. I. B.M.

A Visit to Johnsonburg.

Editor CLAY-WORKER:

Since I subscribed for your valuable paper I have never complied with your request to let you hear from me once in a while. I am not yet ready to say much, if anything, about our proposed plant in Pennsylvania, for the company is just being formed and we shall not get on to the market until next season. We shall probably make pavers. But there is one matter that I want to write to you concerning, and I hope you will find space for it in your next issue.

In looking up the various plants making paving brick in the various states I came across the Johnsonburg Vitrified Brick Co.'s plant of Johnsonburg, Pa. There I met the genial, wide-awake and ever active hustler known by the name of Henry Hasbrouck, and I want publicly to congratulate that company in securing Mr. H. for their plant. While it is true that Mr. Hasbrouck has what he calls a poor plant to work with, yet he turns out a brick which is just simply as good, if not better, than we have found anywhere else; and if he can do that with the present plant, what will he not be able to do when he has overhauled the plant, as we understand he is now about to do? It is always a pleasure to meet with the successful men in the business in which one is about to engage, and I am more than glad to have met Mr. Hasbrouck. A. F. KNOBLOCK.

Detroit, Mich.

A Critic's Criticism.

Editor CLAY-WORKER:

Your issue of October just at hand. It is an exceptionally fine number from different points of view. The account of the summer meeting of the N. B. M. A. is excellent and it will make those members who stayed at home feel like kicking themselves for not coming to the World's Fair.

Speaking of kicking, I wish to register a kick with you in regard to the publication on your first page of the article entitled "The Masterpieces of the Clay Industry Exhibit." The writer of the article, who does not sign his name, clearly shows that in a fit of enthusiasm he calls masterpieces articles which in cold blood he could not verify with best expert opinion in the country.

Although I must coincide that the execution of the design as made by the artist, Mr. Louis Potter, deserves all the credit which could be given to a work of art. Masterpiece is a big word, and masterpieces must be executed as being masters in every respect, and it certainly cannot be said that the "Sun Worshippers," as such, are masters in the technical end of the execution and does not deserve "the most merit for technique." The matt glaze on this terra cotta is crazing in great style, and the salts on the surface brought by efflorescence have been at times so bad that every technicist has turned away disappointed with the feeling that a firm which was willing to spend such a large sum of money on the artistic side forgot all about the technical side and left the job unfinished.

Your correspondent also states that European potteries never attempted such work, which statement goes also to show that he is more idealist than ceramist and not at all familiar with the technical side of the terra cotta industries abroad. In matt glazes, and even in crystal glazes on terra cotta, France and Germany are ahead of this country.

It is all right for a man to be enthusiastic over the "Sun Worshippers" when it is beneficial for himself, but your correspondent displayed bad taste to air his enthusiasm to such an extent as to work an exhibit for a Grand Prix when it does not deserve it.

Trusting you will give this matter space in your December issue and thanking you for your kindness in doing so, believe me,

A TECHNICAL CERAMIST, BUT NO IDEALIST.

Doubled the Previous Season's Work.

Editor CLAY-WORKER:

Enclosed you will find $2.00 in renewal of my subscription to that most excellent of all trade journals, THE CLAY-WORKER.

Thanking you for your inquiry as to how business is with me, I desire to inform you that it became necessary for me at the beginning of the season to put in a disintegrator and add very much to my kiln capacity, so that, without any artificial means of drying, I have made (and sold) somewhat over 5,000,000 brick, as against 3,000,000 last year. And having been compelled to refuse a great many orders during the year, as soon as my brickmaking season ends, next Saturday, 22d inst., I shall forthwith proceed to install a dryer and a more powerful engine and expect to begin my next season's brickmaking by next Christmas, instead of end of March, as formerly. F. D.

Orangeville, Md.

Fireholes.

Editor CLAY-WORKER:

In the September issue an article appears discussing "Fireholes; Small Ones and Many, or Large Ones and Few." This is an important subject and possibly may be profitably considered further.

The quality and quantity of clay in a kiln determine the amount and intensity of heat necessary to burn that kiln. A refractory clay requires a high degree of heat to produce the physical and chemical changes which are made in burning, while a tender clay will undergo those changes at lower temperatures. A kiln set with brick will contain more clay than when set with hollow ware made of the same clay and will require more—a greater quantity of heat to burn. Some clays may have a higher specific heat than others and require more heat per ton. The greater quantity of heat required to burn the larger amount of clay may be supplied by applying the heat for a longer time or by increasing the intensity, if the clay will bear it, but it makes no difference to the ware whether the heat be produced in many small or few large fireholes. The kiln and clay only require that the proper intensity and amount of heaat be properly applied and distributed.

DISTRIBUTION OF HEAT.

Heat is distributed throughout the kiln by an arrangement of the flues leading the draft from fires to exits, be that a chimney or chimneys or openings in top of the kiln. Experience with modern improved and patented kilns teaches that this heat distribution may be made satisfactorily with many or few fires, with small or large fireholes. The fires may be arranged at intervals around the kiln or grouped in a battery of fires at one place or massed in one large fire. The heat from these large and combined fires is distributed throughout the kiln by adjusting the size, length and number of flues leading from the fires to the kiln and from the kiln to the chimney, chimneys or exits. In short, experience and modern practice teach that all kinds of clays and wares may be burned successfully in many styles of kilns and with many styles, sizes and various numbers of fireholes. The ware to be burned in the kiln requires a definite amount and intensity of heat, but does not dictate, specify nor care how, where nor by how many, nor what size the fireholes shall be that produce the necessary heat. The combined capacity of the fireholes must be sufficient to produce the necessary amount and intensity of heat, but their number and size are subject to variation and may be arranged according to requirements aside from the quality or quantity of the clay.

LARGE FIREHOLES PREFERABLE.

Small and many fireholes have more parts to get out of order and to need repairing. They have more projections into the kiln and have more cold corners. They require more fire brick for furnace walls and bag walls, and take more space in the kiln than the same furnace capacity when in fewer and larger fireholes. With this greater amount of enclosing wall for an equal amount of fire surface the small fireholes will become more obstructed by clinkers adhering to the walls, thus reducing their effective fire surface. Small fires are more variable than large ones and require more care and attention than large ones to maintain a steady temperature. D. W. Stookey.

Busy Times and Troublesome Clays in Kansas.

Editor Clay-Worker:

Please find enclosed $2.00 to extend my subscription another year. The demand for brick in this locality is brisk, exceeding the supply. There are very few clay beds in this vicinity suitable for making brick. Lime is the principal trouble. We have alkalin, gypsum, magnesia and common lime pebbles in our clay, and if there is anything else which will dissolve when burned I think it may be found in the clay here. Nevertheless, we have a clay bed which is quite free from lime, and we expect to increase our capacity and put in a dry press for our next season's work. A small plant was put in at Colby, Kan., this year, but they have not had much success. Parties are making some tests at Logan, Kan., with a view of putting in a plant if they find a suitable clay.

M. E. W.

ELECTRICITY AS A MOTIVE POWER FOR BRICK-MAKING.

THE FIERCE COMPETITION of to-day brings into high light the importance of mastering all the details connected with manufacturing and utilizing any improvement which may reduce the cost of the output, and so enable the trade to pass through most trying periods of depression. The situation is one which needs the most careful analysis, and when one considers the vast strides electricity has made during the last fifteen years, we do not think it out of place to offer to our readers the suggestion that there may be "something in it" of decided advantage to the clay trade.

The transmission of electric power for manufacturing purposes is now very fully demonstrated by the numerous generating stations dotted about all over the country. From these stations power is largely supplied for tramway work, and in congested manufacturing districts it is rapidly dispensing with the numerous small engines and boilers which each individual firm have hitherto been compelled to install. It is no uncommon thing to find large works utilizing the power from the central stations, a system profitable to both parties.

It must not be concluded that we are of opinion that electrical driving would be profitable under all conditions, for it is perfectly obvious that so long as coal is the factor and the engine so arranged to be alongside its work, without being compelled to turn round long lengths of shafting for transmission purposes, steam will undoubtedly beat electricity in cost of producing power. The question would then arise: Where is the gain from electrical power? This largely rests upon the well-known fact that "power can be produced more economically by a very large steam plant than by a small one." Therefore, were a central station placed in the neighborhood of a number of brickyards, or, as a matter of fact, any business where power is utilized, and the power retailed according to requirements, there is the certainty that much economy would be gained.

Some will scarcely see the point from this bare statement, but if it be remembered that the aggregate power which a central station plant supplying a certain district is called upon at any given time to supply, is considerably less than the sum of the maximum outputs of the small plants required to do the same work, this alone makes it evident that there is a wide margin between the figures amounting to at least a ratio of two to three. An electrical motor certainly does not require the same attention as a steam plant, and much less space is occupied, whilst it is readily fixed in position to suit the machinery which may be required to be fixed to suit the series of operations.

Take a belt-driven pipe machine, This without present shafting arrangements must be placed to suit the drive, but with a motor the machine could be placed in the center of its drying floors, and instead of having to carry the finished pipes the longer distances the alteration would permit the tempered clay to be conveyed to the machine, a method costing less than before, for it is well known that clay is more easily moved than the finished product, and at a less cost. There remains little doubt that with the development of the huge electric power distribution schemes now in various stages of progress we may look to some substantial change in the obtaining of power.

Of course, the question of cost of power will always govern the choice of plant, but we are promised that it will soon be possible to obtain electricity at a cost of 1½ cents per unit, and where a large quantity be required for the daily load the price may be lower than this. Here we cull a paragraph from *Everyday Electricity* which bears largely upon our views and which, we trust, will meet with due consideration. *Everyday Electricity* asserts that a predominant feature of every progressive manufacturing firm is the utilization of electricity. The cost of power transmission is reduced, and machinery may be grouped with no other regard than sequence of operations. These two factors make for efficiency of production by reducing the labor of handling during the process of manufacture, and eliminating the power wasted in shafting and belts. It is the general adoption of electrical distribution of power that has contributed as much as anything to the industrial success of our foreign competitors. In this country there are signs of a fuller realization of the advantages of a public supply of cheap electric power, and the gradual supercession of belts and shafting by the electric motor. The present lull in trade affords an excellent opportunity for making the necessary alterations, when the inconvenience of reorganization will not be felt. Thus an easier market will find the British manufacturer as well equipped as his foreign rival, and the prices at which he will be able to turn out his goods will put an end, once for all, to the bogey of "unfair" competition.—*The Brick and Pottery Trades Journal, London.*

NEW HAVEN NEWS.

ALL IS WELL at New Haven in the brick line. The yards of that section are now closing down after an exceptionally long and busy season. The demand for brick has been strong and steady throughout the building season. Notwithstanding, prices have not soared to any great height, but have remained stable at about the $7.00 mark. Frank Stiles wore "the smile that won't come off" when seen at his office. The Stiles plants—he is managing four of them—have been kept going full-handed all season long, but have not been able to accumulate any considerable amount of stock on the yards.

The friends of Captain Crafts will rejoice to learn that he is still hale and hearty and is just as much of an enthusiast on the superiority of brick as a building material as when he was actively engaged in the business.

The Merwin plant at Berlin has prospered under the management of Mr. Clifford Merwin, who assumed charge early in the season, and they will probably reach their full yearly capacity, 50,000,000 of brick before they close down for the winter.

Davis Bros., whose plant is at North Haven, had a good season, so far as the making and marketing of their brick. William Davis, the senior member of the firm, has been in poor health, and so has not been able to give the time and attention to the business which it was his wont to do.

The Eastern Machinery Company, New Haven, Conn., says that the demand for New Haven stock brick machinery shows a gratifying increase. They now make both a vertical and horizontal machine. J. Wheaton Stone, the manager, expressed regret at not being able to attend the midyear meeting of the N. B. M. A., at St. Louis, and promised to be present at the convention at Birmingham, Providence permitting.

The Pittsburg Brick Company is particularly well pleased with the business they are getting on the vitrified paving brick made at their Pittsburg plant. They are having no trouble to sell all the brick this plant can turn out at $9 per 1,000 at the plant. In fact, all their trouble comes from the fact that they cannot supply them faster at the price asked.

BRICKMAKERS AND BUILDERS AT THE HOOSIER CAPITAL.

Mr. William Jungclaus, one of the leading contractors of Indianapolis, Ind., contemplates the organization of a company for the building and operation of a modern building-brick plant, to be located in the immediate vicinity of Indianapolis. In an interview Mr. Jungclaus said to a representative of the Clay-Worker that the announcements which had been made in the local press and copied by the various trade papers were rather premature, that definite plans had not been determined upon, and that, while a plant may be built, it is not a certainty as yet.

Fred Adams, who succeeded to the management of the Adams Brick Co., Indianapolis, on the death of his father, J. C. Adams, reports a very busy and satisfactory season. Their plant at Martinsville, Ind., has been run up to its full capacity throughout the year, and November finds them with but little surplus stock on hand. On November 15 Mr. Adams left home for a trip South, intending to go as far as Mobile, Ala. It is safe to predict that he will visit every brickyard that he can reach during the journey, for he is a thorough enthusiast in all matters pertaining to the brick business, and, like his father, appreciates the advantage of keeping in touch with the trade and those connected with it.

This has been a good year for brickmakers in Hoosierdom. The demand for brick has been good throughout the building season, and it is now exceptionally active. Mr. A. W. Penny, the Manager of the Marion Brick Works, with plants at Marion and Montezuma, reports the largest October in the history of his company, which is probably the largest in matter of capacity of any brickmaking concern in the State. One good feature of the business is the stability in prices. But little fluctuation has occurred, the average price ranging a little above $7 on board cars.

The National Dry Kiln Co., Indianapolis, report an exceptionally good year. They have been busy right along, and now have orders booked that will keep them going full handed well into the new year. They have recently established a new department at their plant, and have erected a large addition and equipped same with a line of special machinery for the manufacture of boilers, smokestacks, metal tanks, and sheet iron work of every description.

Messrs. C. & A. Potts & Co. have been kept quite busy with orders for their tempered clay brick machinery, brickyard supplies and Potts' disintegrators. Mr. Albert Potts recently returned from an extended trip West. He visited most of the prominent points on the Pacific Coast and brought back with him some substantial evidences of the prevailing prosperity there in the form of orders, among which were complete equipments for the Carston Brick Co., Seattle, Wash., and the Bay View Brick Co., San Francisco, Cal., consisting of brick machines, disintegrators, sanders, clay cars, etc.

The Standard Dry Kiln Company reports a very gratifying increase in trade. "Things were a little dull with us through the summer," said Robert Elliott, the president of the company, "but judging from present conditions, the year on a whole will be one of the best we have ever had."

James W. Hensley, dealer in brickyard supplies, says he has been worked so hard all through the year that he will certainly have to take an extra week off Convention time, and make the side trip to New Orleans. His latest sale is that of a new "Monarch," a mold sanding machine, large granulator and other supplies, to John Walter, Martin, Tenn.

THE C. W. RAYMOND CO. ESTABLISH A BRANCH OFFICE AT BIRMINGHAM, ALA.

Mr. C. H. Wilson, of Gloucester, Ohio, will represent the C. W. Raymond Company, of Dayton, Ohio, in their Southern territory, with headquarters at 314 Woodward Building, Birmingham, Ala. Mr. Wilson is a young man of considerable attainments, who has been successful in the various vocations he has espoused, especially is he well fortified in knowledge of clays and clay manufacture in general.

THE L. E. RODGERS ENGINEERING CO.

The above is the new firm name of a company that has succeeded to the business of the Rodgers-Thayer Engineering Company, Chicago, Ill. Mr. L. E. Rodgers, having purchased Mr. Thayer's interest and good will in the business, is now "It" with a capital I, and is open to the congratulations of all his many friends in the clay business, to whom he will be very glad to talk waste heat dryers on any and all occasions. Mr. Rodgers is an expert in this work, and if any of our readers are having trouble with their dryers, if they will call in "Dr." Rodgers they can count on getting speedy relief. Mr. Rodgers has installed many of the most successful waste heat drying systems now in operation in this country. His experience in this work is valuable; nevertheless, he is ready to share it with all who are looking for information on this subject. See ad on page 515.

MEETING OF THE ONTARIO CLAYWORKERS.

The third annual convention of the Ontario Clayworkers' Association will be held at Waterloo, Wednesday and Thursday, December 7 and 8, 1904. There will be a reception Wednesday morning at 10 o'clock, when visiting clayworkers will be welcomed by the officers and members of the Association. A business session will be held at 2 P. M., when a number of questions of interest to all engaged in clayworking will be discussed. A banquet will be served at the Zimmerman House at 7:30 P. M. Thursday forenoon will be devoted to a side trip to the brick plant of Bechtel Bros., and the afternoon and evening will again be devoted to convention work and social pleasure. Arrangements have been made for reduced rates over the Canadian Pacific and Grand Trunk Railways. Those desiring to avail themselves of this concession should pay full fare and take a *stamped certificate,* which, when countersigned by the Secretary of the Association, will entitle them to a return ticket at reduced rate. Visiting clayworkers will be welcomed cordially, and a large attendance is anticipated. Headquarters for reception committee will be at the Zimmerman House. Among the features of the Convention will be a lecture by Thomas W. Gibson, Director of the Bureau of Mines at Toronto, on "The Form and Origin of Different Clays." If any of our readers desire a complete programme, they will please address the President, B. E. Bechtel, Waterloo, Ont.

THE NEW YORK BRICK MARKET.

The brickmaking season for 1904 has closed, the last pits of the season were run out on the 7th of November. It has been some years since the yards have continued so late in the season. The manufacturer would like to keep on making, but the frost says "no," and the green brick will not dry. It has been a profitable season all the way through, though in the spring the outlook was far from bright. As in times past, an unexpected change came, which made all connected with the trade as happy as lords.

THE MARKET

Is taking stock as fast as placed, the brick barges not laying in market more than one day. The prices range: hard, $7.37½; something fine, $7.67½; light hard, $5.75; the choice brands and common grades are near neighbors. The local rates at the sheds are: hard, $6.25; light hard and good pale, $4; swelled, $3.50. Delivered on cars or one mile from yard, hard are $7, light hard $5, swelled $4.50.

A. N. Oldtimer.

PATENT SUIT.

Suit was brought Feb. 23, 1904, against the Hamilton Brick Company, of Hamilton, Ohio, by the Horton Manufacturing Company, of Painesville, Ohio, for infringement on their patent on their Hercules brick machine. The Hamilton Brick Company is using a machine made by the Arnold-Creager Co., of New London and Cincinnati, Ohio., and is called by various names such as "S. S. S.," the "New Century," the "Success," etc. 5tf L.

THE CLAY-WORKER

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TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

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One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
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☞Subscribers when ordering a change of address should give both the old and new address.

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Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

VOL. XLII. NOVEMBER, 1904. No. 5.

CURRENT COMMENT.

Clay, like the character of men, must be tried by fire to demonstrate its full value.

* * *

Honesty is that trait which sometimes makes a man not do things that greed tempts him to do.

* * *

A great reminder of the flight of time is the Louisiana Purchase Exposition. Only a few more days and the great Fair will be a memory.

* * *

Our country has just recovered from its quadrennial attack of politics. A very benign attack it was this time, with scarcely any feverish symptoms. Now we can give all our attention to healthy business and occupations.

* * *

We have investigations and government inquiries upon nearly every conceivable subject, but no body of scientific men appears to have worked upon the problem of a country, possessing all the gifts of God, ever being afflicted by hard times.

* * *

We have given a lot of attention to the subject of discoloration of brick, so now why not turn around and get at it another way by giving attention to the matter of coloring the brick, putting in "fast" colors of whatever shade desired?

* * *

St. Louis has been favored of the gods. A marvelously temperate summer was succeeded by an Indian summer, and now the newly elected President of the United States will pay a visit to the exposition, which the concourse of peoples will surely convert into a triumphal procession.

* * *

The well-burned clay brick, after sharing the honors of architecture with marble, granite and timber for thousands of years and proving itself the best of all, is now being threatened by cement blocks and sand-lime bricks. There is room enough for the new products, and it looks as if they will be welcome, but the burned-clay brick will probably still be made and in common use 2,000 years from now.

* * *

There is at present no sign nor probability of hard times in the United States, but this is just the season and the hour to consider the question. "In time of peace prepare for war;" in time of prosperity prepare for adversity, not by putting a few dollars in a bank that may go down with a run, but by making adversity in our land an impossibility. In the scientific regulation of the nation's wellbeing we are not yet much farther ahead than our remotest ancestors.

THE CLAYWORKERS' THANKSGIVING.

It is meet that we should pause at times, take our bearings and give thanks to the Divinity that shapes our ends, for the good things of life that are our portion. This is one of the periods of thanksgiving when we may look backward with great satisfaction, and peer into the future without misgivings, for the signs of the times all point to the uninterrupted continuance of prosperity. Peace and plenty are ours. Never before was the future more promising. Success seems waiting upon every worthy enterprise. Clayworkers may well celebrate the anniversary with merry feasting and thankful hearts, for so far as our commercial life is concerned, the sky is cloudless.

BUILDERS OF CLEVELAND PAY TRIBUTE TO W. H. HUNT.

The Builders' Exchange of Cleveland recently celebrated its anniversary, and elected a new Board of Directors. Wm. H. Hunt, who has been president of the Exchange for four years, during which time it has prospered phenomenally, declined a fifth election. As a token of appreciation of his services, the members of the Exchange presented him with a beautiful silver loving cup. Mr. Hunt was succeeded as president by Mr. William B. McAllister, who served the Exchange the past year as vice-president. While a young man, he has developed fine executive ability, and there is but little doubt that under his direction the Exchange will continue to prosper. This is all the more assured, as he retains as his right-hand man and secretary, E. A. Roberts. Without "Teddy," the Exchange would be a barren ideality. With him it is a power for good in the building and kindred interests of Cleveland.

GOING TO BIRMINGHAM, AND WHY.

There is nothing which educates the mature man or woman so much as travel, and there is no travel so beneficial as travel in one's own country. When one travels abroad, he sees what is of great interest because so different from our own environment, but he sees little that is of any practical benefit. Not so when traveling in our own country. The people of the North have much to learn from the people of the South. The South, in turn, may profit much by a better knowledge of the North. We of the Middle West may travel to all points of the compass with both pleasure and profit, and we have that of which to give those who come to us.

The meeting of the National Brick Manufacturers' Association at Birmingham, Ala., offers the clayworkers an excuse for a trip South. They will find in Alabama a section where producers of wealth bring up from the bowels of the earth great wealth in the form of gold, iron and other minerals. Birmingham is one of the cities to distinctly bring to the North the idea of the mining and manufacturing possibilites of the South, but that was many years ago. The South now ships iron into Pennsylvania and the North, and she ships manufactured cotton goods into Boston, New England and all over the world. What was erstwhile the New South is now the established South, the mature and healthy South; a South not only rich in possibilities, but rich in fact, rich in accomplishment, and with yet greater riches in sight. Birmingham is a great manufacturing center and offers unexcelled facilities for a pleasant and profitable convention. The meeting of clayworkers there, beginning January 30th, ought to be the largest in the history of the National Association. See Official Announcement on page 470.

TRADE LITERATURE.

THE NEW YORK BLOWER CO., Chicago, Ill., has issued a handsome catalogue devoted to their Hot Blast and Waste Heat Dryer as applied to the needs of brick, terra-cotta and pottery manufacturers. It is handsomely illustrated. A copy can be had for the asking.

THE JEFFREY MANUFACTURING CO., Columbus, Ohio, has published a new catalogue devoted to the "Century" Rubber Belt Conveyors, which is profusely illustrated and demonstrates that these conveyors are adapted to a multitude of purposes. It is a handsome book and can be had for the asking.

THE AVERY STAMPING CO., Cleveland, Ohio, has favored us with a copy of a new folder, telling of the merits of their steel railway ties, which are well adapted to the needs of clayworkers, or for use on plantations, or any industrial purposes where changes of track are constantly being made. They solicit correspondence.

THE AREGOOD CONSTRUCTION, CO., Chicago, Ill. has published a catalogue which, while devoted chiefly to the Aregood Dryer, contains considerable valuable information on the planning and equipment of modern brick and tile plants. It is handsomely printed, and impresses one with the idea that whatever the A. C. Co. do, they do right. They will be pleased to have our readers write them direct for a copy.

"GULF COAST TOURS" is the title of a six-page folder issued by the International Land and Harbor Company, Indianapolis. It tells of "a trip of a lifetime" to Birmingham, Ala., and other Southern cities. The manager of the I. L. & H. Co., Wm. J. Bell, is arranging for a number of excursions to Gulf points which will appeal strongly to any one desiring a brief winter vacation, and will be pleased to have those interested address him on the subject.

THE ATLAS CAR AND MANUFACTURING CO., Cleveland, Ohio, has favored us with a copy of their new catalogue, in which there are a number of fine illustrations of a number of clay cars of new design. Their latest offering, a triple deck concrete building block car, is shown, also a line of cars for sand-lime brick plants. They manufacture a varied line of dryer cars, and will be pleased to supply those wanting same, with descriptive matter and prices.

THE HARRINGTON & KING PERFORATING CO., Chicago, Ill., is out with a handsome mailing card showing in colors the different patterns of perforated metals which they make. Their line includes every description of perforated metals for screens of all kinds. They have made a specialty of this work for years and have one of the best equipped plants in America for the production of perforated metals. Clayworkers will always profit by communicating with them when in the market for material of this sort.

"CONCERNING CLAY TESTING" is the title of a four-page pamphlet issued by the Crossley Manufacturing Company, Trenton, N. J., and which tells of the improved clay-mixing and filtering machine, which is something new in clay machinery. Those who are using it say the apparatus is invaluable for manufactories of fine goods, such as sanitary ware, china ware, etc. The pamphlet and other printed matter touching on appliances for pottery and tile manufacturers will be sent free on application to readers of THE CLAY-WORKER.

A RATIONAL BASIS OF WAGES.

A very able paper on the above subject was read before the Society of Mechanical Engineers recently by Mr. Harrington Emerson, in which he expresses the opinion that "A living wage is due to every man, etc., etc., who signs away his liberty to another, whether he stands around idly to glorify his employer or to amuse himself." He considers a special reward due for exceptional and unusual co-operation, either of mind or body, or both, since the earning of such a wage, while not implying harder or more exhausting work, requires more understanding and co-operating work, and may be divided into three forms: 1. For use of body. 2. For use of hands and eyes. 3. For use of head and heart.

Our contemporary, the *Mining Magazine,* comments in this in the following manner:

As a matter of fact, it would be difficult to find any successful manufacturing enterprise which does not follow just such a principle. No enterprise otherwise managed could succeed. But the employer cannot be omnipresent. His employes are subdivided into groups and each group is controlled by some one man who has shown himself proficient to act as a foreman. It is he who must judge merit in his group and reward it; and he, with the other foremen, is, in turn, judged and rewarded by the next in authority above him.

Writers on a subject so complex as this should carefully differentiate between groups and classes of labor. Of course, all work is labor. The employer labors in common with the water-boy at the works. But the great mass of laborers who can do only what they are shown and those who can do that which has been explained to them, are separate and distinct from those of a higher grade who think what should be done and how to do it. The first class represents the bulk of the labor of any country and is in general without the ability to understand academic philippics as to its rights and the reasons for its rights; its wrongs, or the reason for them. It recognizes only so much money which it receives at the end of the day for the minimum of work which it has been able to do without being dismissed. It acts as a pliant body in the hands of those with the intelligence to appeal to its animal sensations or its desire to obtain that for which it has given no proper work as compensation. It is for labor of this kind that a rational basis is needed. Intelligent labor quickly finds a rational basis on the broad and permanent foundation of its ambition and the relation between its brain and its hand in the work which it has to do.

IMPROVEMENTS AT KNOXVILLE, TENNESSEE.

The directors of the Knoxville Brick Company, at Knoxville, Tenn., recently authorized the expenditure of several thousand dollars for improvements at their plant, having in view a material betterment in the quality of their brick, and also the handling of raw material with less labor. Chambers Brothers Company, of Philadelphia, have the contract for the machinery required, and it is the intention to install same as soon as the present brickmaking season is over. It will in a measure duplicate the outfit of clay preparing machinery that they so successfully installed for the Hanover Brick Company, at Whippany, N. J.

We would refer brickmakers looking for a bargain in the way of a good second-hand equipment for a brickyard, to the "For Sale" ad of the Superior China Clay Company, Chippewa Falls, Wis. They offer brickmaking machinery, dryer, dryer cars, transfer cars, filter presses, slip pumps, etc., all of which are in good order. Their ad will be found on page 498 this issue.

Underdrainage and irrigation, like two twin sisters, dance hand in hand. Underdrainage, however, draws so fully upon the sources of fertility in growing maximum crops that it can dance alone to delightful measures.

THE CONSTANT READER.

From the books that appear in the course of the year
I turn with decided ennui,
And a feeling of strain at the back of the brain,
Is it something in them or in me?

Those historical tales of Old France and Old Wales,
In days when there never was peace,
With terrific attacks made by Otto the Axe
On Guido the Gimlet of Nice,—
I read that collection with just one reflection,—
Thank Heaven, we have the police!

Nor can I endorse the remarkable course
Of some recent narratives rude,
Where the writer takes jaunts to the animals' haunts
And shows us their life in the nude;
Such as, "Traps I have set," or "Bears I have met,"
Or "Beasts I have tried to Elude."

There's the nautical tale where they keep "making sail,"
A ludicrous statement, if true,
Implying that sailors are amateur tailors,
With no occupation in view.
Then in dangerous cases, they just "shift their braces."
It's called "a tight squeeze," when they do.

They've a skipper who rages through two hundred pages,
Profanely abusing the crew;
He won't give them enough of the poorest plum duff,—
A mutiny's bound to ensue.
But the skipper stays drunk in his eighteen-inch bunk,
Just letting the mutiny "brew."

More than all do I watch for the novel in Scotch;
Its merit I freely admit.
It only needs telling with rational spelling
To make a miraculous hit;
But when I see "braw," "Unco guid," "hoot awa,"
I get indigestion and quit.

I think if we saw a new criminal law,
That if any one enters the ranks
Of those who write fiction and perpetrate diction,
Apparently Gaelic or Manx,
The offense every time is a capital crime,
The law would be greeted with thanks.

—Stephen Leacock, in *Life.*

THE HEATING AND VENTILATING OF LARGE BUILDINGS.

About 133,000 feet (over 25 miles) of one-inch steam pipe will be used in the hot blast heating and tempering coils to be installed in the new Wanamaker Building in Philadelphia. This pipe is being manufactured into 111 "ABC" heater sections, varying in capacity from 3,500 to 56,000 feet of heating surface.

In connection with these heaters and in other parts of the building 28 "ABC" fans will be used, the largest of these having a housing 220 inches high and the smallest 30 inches.

The complete apparatus, which is now being constructed in the American Blower Company's factory, at Detroit, Mich., will make a ten-carload shipment.

"ABC" apparatus is also to be installed in the New York Wanamaker Building, some 44,000 feet of one-inch pipe will be used in the heaters and seven large fans will ventilate the building.

NOTES FROM TIDE-WATER, VA.

The Nansemond River Brick and Tile Company, at Reid's Ferry, Va., have completed a new "Dennis" down-draft kiln and made their first burn in it. They seem to be very well pleased with the kiln. Mr. Dennis was there and superintended the construction.

The West End Brick Company, of Suffolk, Va., have placed an order for a "Martin" steam dryer, and expect to begin work on same at once. Mr. Charles Parker, formerly of Franklin, Va., is general manager.

Mr. C. B. Chase, formerly of Suffolk, Va., now general manager of the Charlotte Brick Company, of Fort Mills, S. C., visited this section last week. He says they have had a very busy season, and have turned out 50,000 brick per day on their large Chambers machine. They have been compelled to do night work in loading cars to keep up with the rush.

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***IT IS MY AIM** to do whatever is given me a little better than it has ever been done before.*

WILLARD D. RICHARDSON,

Consulting Engineer to the Brick Industry.

See pages 505 and 509.

WANTED, FOR SALE, ETC.

FOR SALE—80 acres brick shale land, well located. Kansas natural gas for fuel. Frisco Railroad on the land. Sell part or all.
LADLIE,
11 1 cm Altamont, Kan.

WANTED—Man with practical experience and $5,000 to $10,000 to take an interest in, and management of, a brick company in a rapidly growing city of 150,000. Address WILLIAMS,
11 tf d Care The Clay Worker.

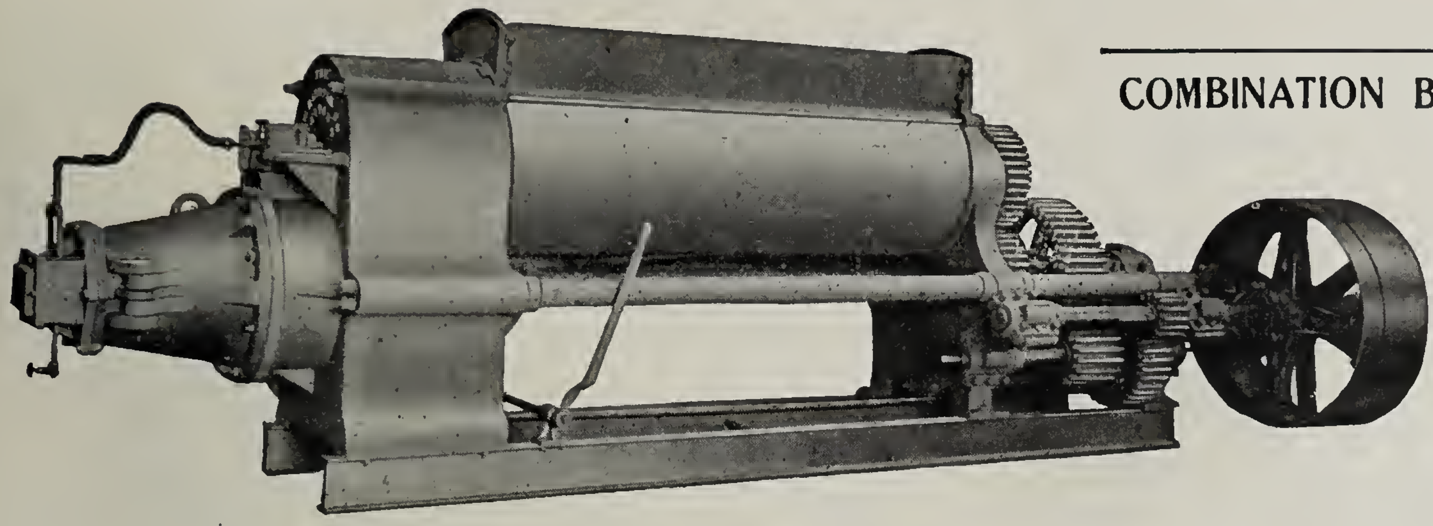
SITUATION WANTED.

As superintendent of porous fireproofing factory. Eight years' experience. Thoroughly familiar with manufacture of all kinds of tile required in fireproofing. Address W. M. C.,
11 1 cm Care Clay-Worker.

WANTED.

The following machinery. Must be in No. 1 shape. One combined pug mill and brick and tile machine, with dies complete, capacity thirty to fifty thousand per day; Fate, Freese, Bonnot or Raymond make. One Bensing's Automatic Side-Cut Brick Table. One automatic tile table; 75 h.p. engine and boiler Write us description of what you have, with lowest price.
T. C. ARMSTRONG,
11 1 cm Shenandoah, Iowa.

For Sale, Wanted, Etc., Ads Continued on Pages 498.



COMBINATION BRICK MACHINE

THE

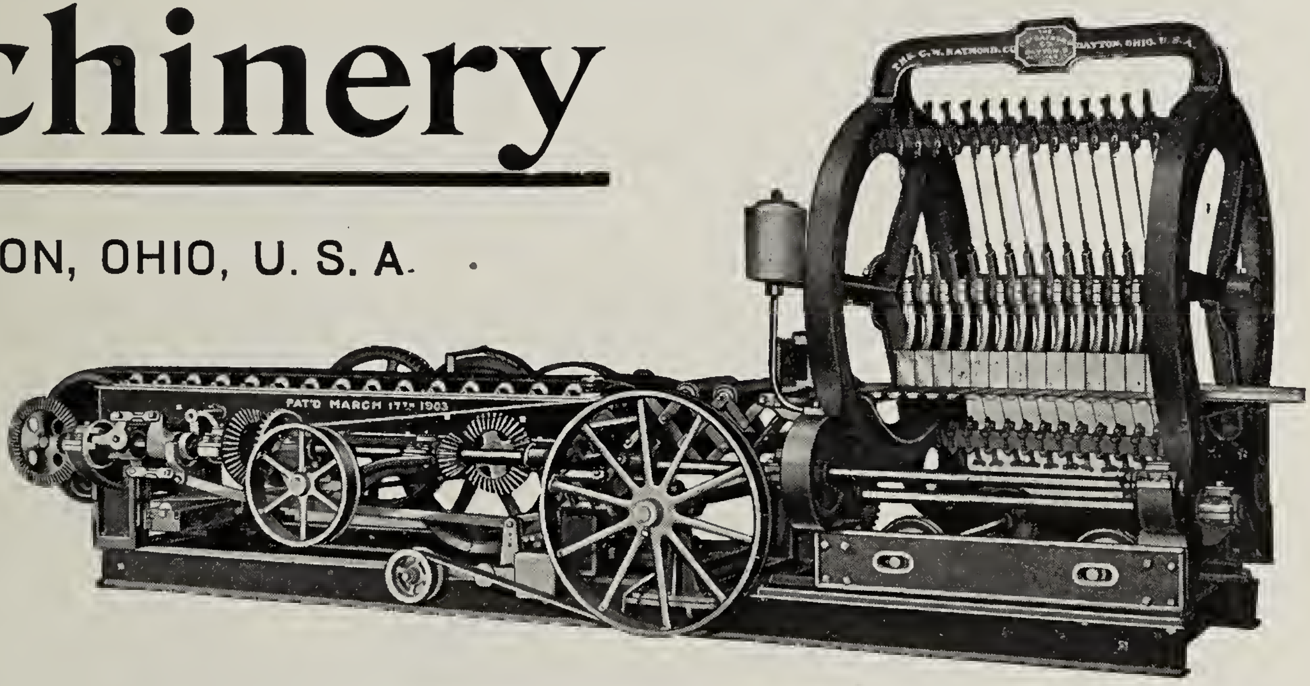
C. W. RAYMOND CO.

Clay-Working

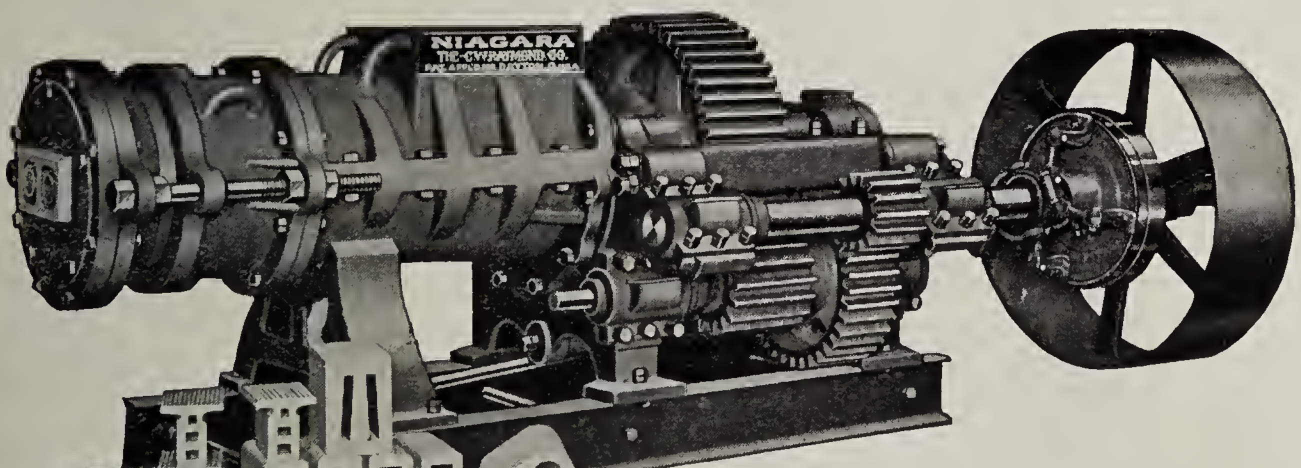
Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street
ST. LOUIS
315 Frisco Building
PITTSBURG
1425 Park Building



AUTOMATIC DOWN-CUT CUTTER



NIAGARA HOLLOW-WARE MACHINE

Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING NEWS.

KANSAS CITY is destined to be the great packing and live stock center of this country, as it is now the great primary grain market. This fact becomes more evident each year. The big Nelson Morris packing house is just being completed, which will greatly add to the packing facilities and increase the market, and now comes a couple more packing plants, and while they are not so large, they will be big plants and will be independent, giving just that much real competition in the live stock market. One of these new packing companies, the promoters of which do not want their plans made known yet, has purchased a ten-acre tract near the stockyards, but on the opposite side of the Kaw River, and will put up a packing house costing between $1,000,000 and $2,000,000, while the other plant will be built by the American Dressed Beef Co. and will only cost in the neighborhood of $250,000. Both will make use of a good deal of brick, however, for little of the price paid for packing plants goes into ornamental work. It is all spent for solid service, and the brick, while of the common variety, is the kind of material for which most of their building fund is spent.

Judging from the present talk by the different applicants for a natural gas franchise for this city, it will be possible in a couple of years to burn brick here with natural gas, piped here from the Kansas field. If this franchise is given out in a manner to insure gas cheap enough to burn brick here, in competition with Kansas brick, there is no reason why the brick cannot be made from the near-by shale beds, and there is every reason to expect this city to make a very rapid growth, in a manufacturing way, just as soon as gas can be furnished to factories at an exceptionally small cost for fuel purposes.

The statement of building permits issued for October, issued by the Building Inspection Department, shows that last month was the record-breaking October by long odds. The total valuation placed on the buildings for which permits were taken out in that month amounted to $1,036,430, which is over double the amount of the permits for the same month of 1900 and $248,290 in excess of the permits for the same month of last year. The larger number of buildings are frame, of course, as that is the class of buildings being put up by the people who are building homes of their own. One hundred and eighty-three permits were issued for frame buildings, with a total value of $383,050, while 51 permits for brick buildings had a total value of $565,300. The weather has been particularly fine for building operations. There has not been a rain to stop outdoor work, no cold weather, and conditions have been almost ideal. This probably accounts to a great measure for the good showing made; still that is the usual kind of weather we have at this time of the year.

The amount of permits issued in October in the last five years are as follows:

1900	$ 452,510
1901	570,120
1902	530,035
1903	788,140
1904	1,036,430

D. W. Pike, city engineer, has filed his report with the board of public works, showing the public work done in the fiscal year ending April 18, 1904. Mr. Pike's report shows that Kansas City had on April 18 nearly 200 miles of paved streets, about 40 miles of which were paved with brick, and that 5 miles of brick streets costing $16,930 had been laid in the year ending at that time, and that over 6 miles of brick sewers had been built in that time.

There is more work in the line of public improvements now under way than there ever has been before at this season of the year. A record which has just been prepared in the office of the city engineer shows that there are now 279 contracts for paving, grading, sewers, sidewalks and other improvements now under way, and there are 82 more contracts ready to be advertised.

This has been a fine year for the brick business in this section of the country. Every plant that tried has been turning out brick at full capacity, and they have been disposing of them at reasonably good prices.

There has been a good deal of complaint in the city about being able to get cars at the right time. This is the fault of the railroads, and, while it is hard for brick men to bear, it is certain the railroads would do better if they could. It is a question of handling a 1904 traffic with facilities prepared for an 1884 traffic. It takes a couple of weeks to get a car of brick to a siding in this city from most any of the Kansas brick plants. Charles Roll, a local jobber, even cites a case where it took him three weeks to have a car set from the west bottoms, in the city, to his yards. It is certain that the railroads do not want their cars bound up that long for nothing, and would make earlier delivery if it were possible for them to do so. They are too much cramped for facilities to do the business. On the other hand, after they once make delivery, they are in a great hurry for their cars, and the demurrage begins at the regular time, no matter if they set ten cars to your track which should have come in one at a time for ten different days, all at once. They must all be unloaded within the regular time.

There has been a drop in the prices of common brick during the past month of $1 per 1,000, cutting down the price of the cheaper grade to $5. This has the effect of shutting out the Kansas brick from this market, as the Kansas brick can be marketed at a better price than that, with the freight charges considered. The fact of the matter is, Kansas brick are not being offered, there seeming to be a better demand than most of the yards are able to supply. One Kansas City jobber has had his order turned down by several of the Kansas plants, on account of their inability to fill it for at least a month. While this is the natural dumping ground for Kansas brick, this is not a dumping year.

In the opening of Thirty-first street, from Main to Roanoke boulevard, the Stukenberg Pressed Brick Company was awarded damages by the jury of $1,200.

BRICK NEWS FROM THE WEST.

The Excelsior Brick Company has been incorporated in Fredonia, Kas.

J. W. O'Neal is about to begin the manufacture of brick in Pine Bluff, Ark.

The Witthoff Brick Company has just been incorporated in Birmingham, Mo.

The Smith Cement Brick Company has but recently been incorporated in Tacoma, Wash.

S. N. Johnson has purchased the brick manufacturing business of Johnson & Jeffries in Laredo, Tex.

The Kansas Concrete Stone Company has been incorporated in Enterprise, Kas., with a capital of $6,000.

The Table Rock Clay Company, of Table Rock, Neb., has amended its charter, making the capital stock $40,000.

The Southwestern Stone and Brick Company has been incorporated in Kansas City, Mo., with a capital stock of $10,000.

The bonds recently voted by Muscogee, I. T., for the purpose of putting in a water works and a sewer system have been sold, and they are ready for the work to be rushed to completion.

The board of public works of Denver, Col., has recommended to the council the construction, at once, of Colfax avenue special sanitary storm sewer, which the city engineer estimates will cost about $50,000.

The city council of Coffeyville, Kas., has let the contract for paving thirty-five blocks of that city to a Leavenworth firm for $127,000. Coffeyville brick is to be used in this paving. The work is to begin at once and the contract to be finished within a year.

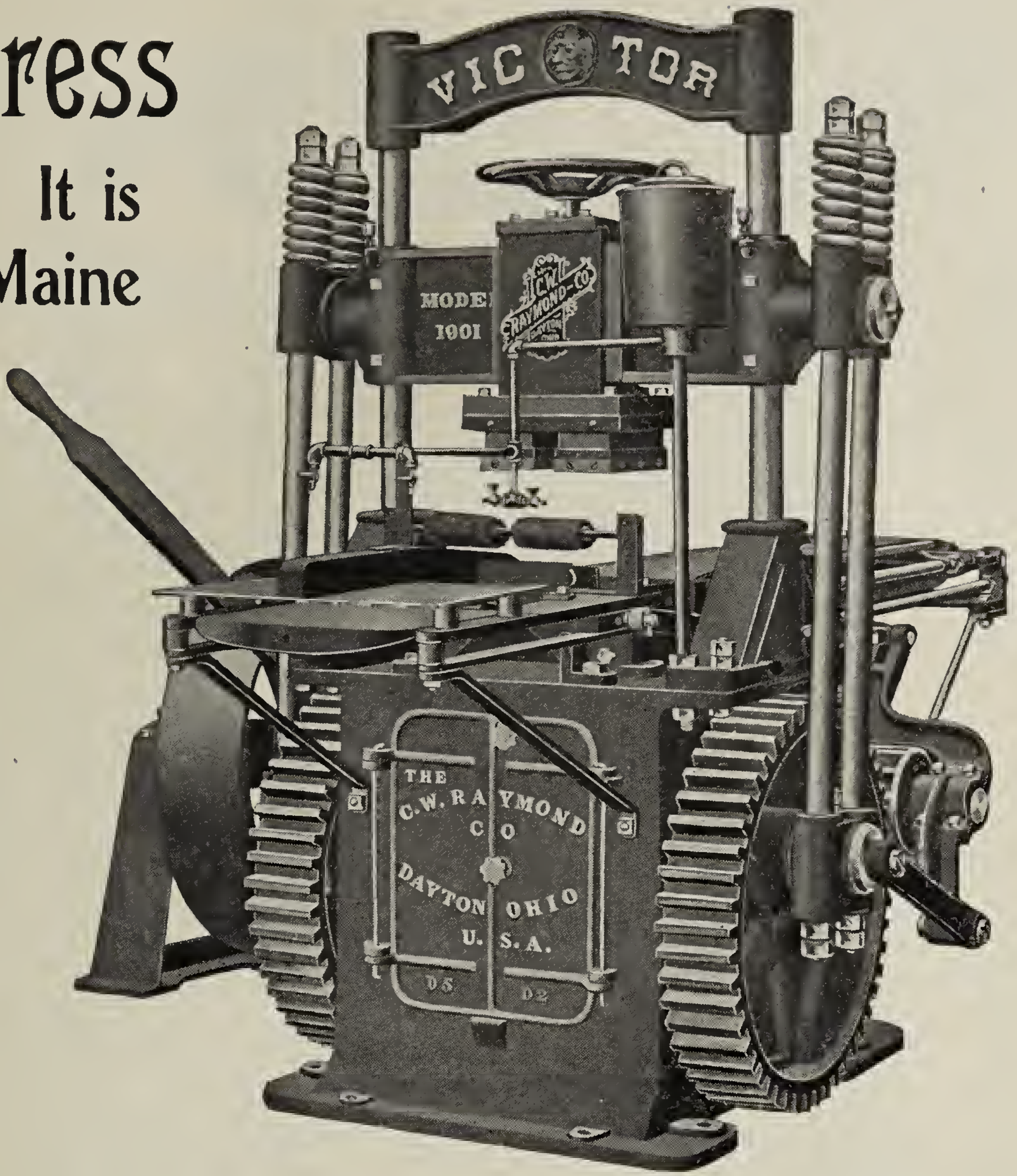
The Newport Brick and Lime Company has been incorporated in Newport, Wash., with a capital stock of $100,000, and will build a brick plant with a daily capacity of 30,000. The following are directors: G. S. Thomas, A. S. Kelsey, William Goodenough and J. M. Batten.

The paving committee of the city council of Austin, Tex., has recommended that Congress avenue, in that city, be paved with vitrified brick. There were three kinds of paving considered—vitrified brick, sheet asphalt and rock asphalt. Dabney & Brown made the most acceptable bid for the work, their offer being $61,500.

Kaw.

The Victor Re-Press

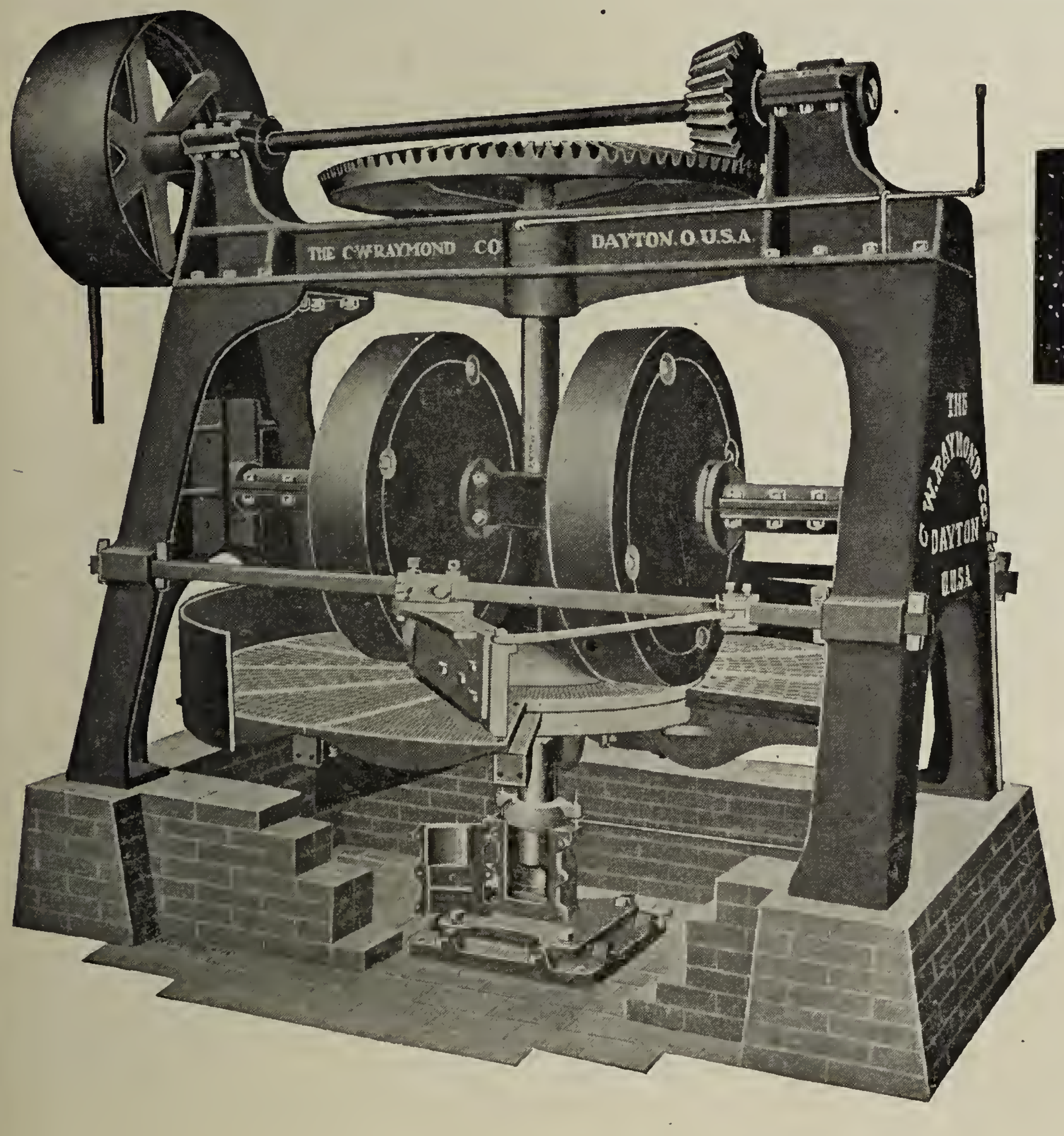
needs no introduction. It is known and used from Maine to California, ✳ also, somewhat in Europe, Asia and Africa.



Our Dry Pan

has more crushing power, and more screening surface than other pans--heavier too

Investigation will Prove it.



THE C. W. RAYMOND CO.

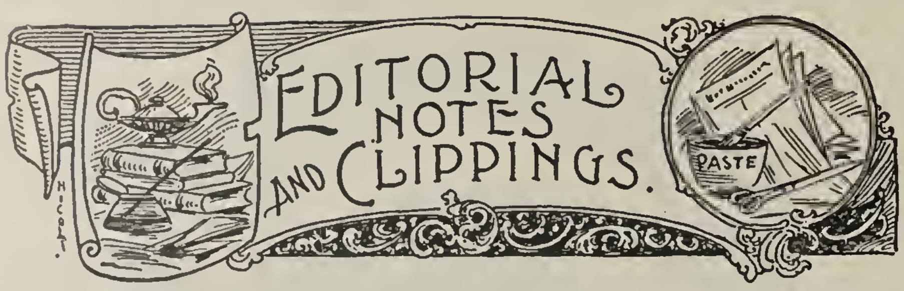
Clay-Working Machinery

DAYTON, OHIO, U. S. A.

NEW YORK
39—41 Cortlandt Street

ST. LOUIS,
315 Frisco Bldg.

PITTSBURG,
1425 Park Bldg.



Evens & Howard sustained a $100 loss by fire at their fire clay works at St. Louis, Mo., recently.

The name of the Stratton Brick Co., Macon, Ga., has been changed to the Cherokee Brick Co.

The Henshaw Brick and Tile Co. has been chartered to manufacture brick and tile at Henshaw, Ky.

W. Meredith Dickinson has been appointed receiver of the Staten Island Clay Co., Woodbridge, N. J.

Charles S. Bierce, of Eldon, Iowa, has purchased the brick plant at Lehigh formerly owned by Frank Corey.

J. A. Norris & Co. is a new firm organized to manufacture brick at Water Valley. Yalobusha County, Mississippi.

The Palouse Pottery Co., of Palouse, Wash., is using the Tecktonius lug on their new kilns now under construction.

W. H. Ashe, Jr., contemplates establishing a brick plant at Rockhill. S. C. which will be under the management of J. B. Mendenhall.

The Triplet Brick Co., Spokane, Wash., contemplate erecting a large plant at Rockford, Wash., where there is a deposit of splendid clay.

The plant of the Corning Brick, Terra Cotta and Supply Co., Corning, N. Y., was slightly damaged by fire which started in the lumber sheds.

The new brick plant at Stanley, Wis., under the management of S. L. Alexander, is now operating smoothly, turning out a first-class brick.

The Berkshire Pressed Brick Co. has been organized at South Berkshire, Mass. They will build an up-to-date plant of 20,000 daily capacity at a cost of $50,000.

Nearly 700,000 brick were ruined by water and 650 feet of shed was destroyed by fire at the Savignac brickyard at Haverhill, Mass. The loss is estimated at $800.

The Gillet Brick and Tile Co., of St. Louis, Mo., has been incorporated by Amos Mackey and Arthur Gillet, Woodhull, Ill.; Joseph I. Curl, of Battlesville, Ind. Ter., and others.

H. E. Balfour writes that he is interested in a company at Vancouver, B. C., that will erect a plant for the manufacture of brick. His address is 2861 Westminster Road, Vancouver.

The Greenville Brick Co., has been organized to manufacture brick at Greenville, S. C. A tract of land has been purchased and the plant will be erected as soon as possible. W. H. Neal is president of the company.

The old brick plant of John Ruch, Davenport, Iowa, has been purchased by Frank B. Pohlman, of Otten & Pohlman, whose plant is located near the Ruch plant. The latter will be remodeled and put in readiness for operation.

The Michigan Paving Brick Co., Saginaw, Mich., has decided to use the Tecktonius kiln band lug, made by the E. C. Tecktonius Manufacturing Co., Racine, Wis., and placed an order for 16 set of 6x⅜-inch lugs through Morley Bros., of Saginaw, Mich.

The Jackson (Miss.) Brick Co. has been organized by A. H. Kirkland, W. F. Smith and W. G. Kirkpatrick, all of Jackson, with $10,000 capital stock. The new plant is located at a point near Jackson, to be known as "Brickton," and will be equipped with modern machinery and appliances.

Mr. Ernst Weiner, who has charge of the New York office of Arthur Koppel, manufacturer of industrial, narrow and standard-gauge railway materials, cars, etc., has just returned to New York, after a three months' stay in Europe. He reports a splendid trade for the past season, with good prospects for a still better year to follow.

James Van Inwagen, until recently a prominent citizen of Chicago, died October 31 from malarial fever at the residence of his son, James Van Inwagen, Jr., at Momence, Ill. He came to Chicago in 1854. At the time of his death he was president of the Tiffany Enameled Brick Co. Mr. Van Inwagen was born at Fairfield, N. Y., in 1837. After coming to Chicago with his father he entered the insurance field and was instrumental in forming the Traders' Insurance Co. Two sons, Fred Van Inwagen and James Van Inwagen, and one daughter, Mrs. Whitney Mockridge, survive him.

The Kalona Brick and Tile Co. is increasing the capacity of its plant at Kalona, Ohio, with a view of making a specialty of tile the coming season.

F. Entriksen, of Tavistock, Ontario, Canada, has leased the old Jarvis yard for ten years and will fit up a new, up-to-date plant in every particular.

Clark & Brown Brick Co.'s plant at Grand Rapids, Mich., was badly damaged by fire early the morning of October 16. The origin of the fire is a mystery.

The Wisconsin Brick and Fuel Co. has been incorporated at Oshkosh, Wis., with $200,000. The incorporators are M. H. Eaton, W. H. Jeffers and R. H. MacDonald.

Hebron, N. D., has a new brick manufacturing plant, to be known as the Hebron Fire and Pressed Brick Co., in which Charles Weigel, F. Leutz, E. Weigel and Herman Leutz are interested.

Frank H. Wolf, son of F. H. Wolf, the well-known brick manufacturer of Detroit, Mich., and Miss Catherine Thomas were quietly married recently, and are spending their honeymoon on the Pacific coast.

The Standard Brick Co., of Mound Valley, Kan., has been organized, with $30,000 paid-up capital. The directors are George R. and George W. Fruman, of Elk Point, S. D., and George F. Hammar, of Mound City.

George Coleman, an employe at the McHose Clay Works, Boone, Iowa, was caught in the machinery and so badly crushed before the machine could be stopped that he died a short time after being taken to the hospital.

The Orrville Pottery Co., Cleveland, Ohio, has been organized by Jas. P. Madigan, Z. T. Armstrong and other Cleveland men, with $100,000 capital stock. The plant will be built at Orrville, Ohio. They will manufacture jugs and other earthenware products.

The plant of the Ashland Fire Brick Co., Ashland, Ky., was totally destroyed by fire October 24, which started in the dry house. The loss is estimated at $10,000, partly covered by insurance. This is the second time this plant has been totally destroyed by fire.

Fire, which was supposed to have been caused by spontaneous combustion, resulted in a $400 loss at the Trenton (N. J.) Fire Clay and Porcelain Co.'s works. The flames started in the dryer and by hard work on the part of the firemen were kept from spreading to the main building.

The Versailles Fire Brick and Clay Co., of Versailles, Mo., has purchased 21 set each of 6x¼ and 8x¼-inch kiln band lugs to be used in the banding of their kilns. The Tecktonius lug is rapidly gaining notoriety for its durability, neatness in construction and its simplicity in applying it to the band.

The Darlington Brick and Mining Co., Pittsburg, Pa., in a recent letter renewing their subscription, say: "We have no reason to complain of business, for our shipments have been greater this season than last and the prospect for the future is very good. We have booked a number of good orders for several of the large cities."

E. L. & J. Hand, Plainfield, N. J., lost so many brick this last season on account of heavy rains that they are now building an addition to their brick plant to be used for storing or weathering clay, and as well a large dry house. This will enable them to prolong their season of manufacture. When the additions are completed the plant will have a daily capacity of about 30,000 brick.

J. L. McKimmey, Metamora, Ohio, reports that he has had a splendid trade the past season. His plant is equipped for the manufacture of both brick and tile, but he devotes most of his attention to tile, which he makes in sizes from 3 to 10-inch. He has closed down his plant for the winter with 500,000 tile in his stock sheds, but he will probably not have any of them left when spring comes.

The Ohio Ceramic Engineering Co., Cleveland, Ohio, report a good year. They have recently put a new steel dump car on the market which they think has merits which place it ahead of any other dump car now on the market. Among recent shipments is a second repress to the Chestnut Ridge Brick Co., Kunkletown, Pa., and a repress to the Suburban Brick Co., Wheeling, W. Va. They have also booked a number of fine orders in the last month, including a repress for the Newburgh Brick and Clay Co., of Cleveland, and a complete plant for the Calder Brick and Coal Co., Calder, Pa. They say they are also getting their share

[CONTINUED ON PAGE 494.]

The "Big No. 6" "Monarch" Brick Machine.

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"Monarch"
Brick
Machines
in use.

OVER
500
"Quaker"
Machines
in use.

WRITE
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Disintegrators,
Pug Mills,
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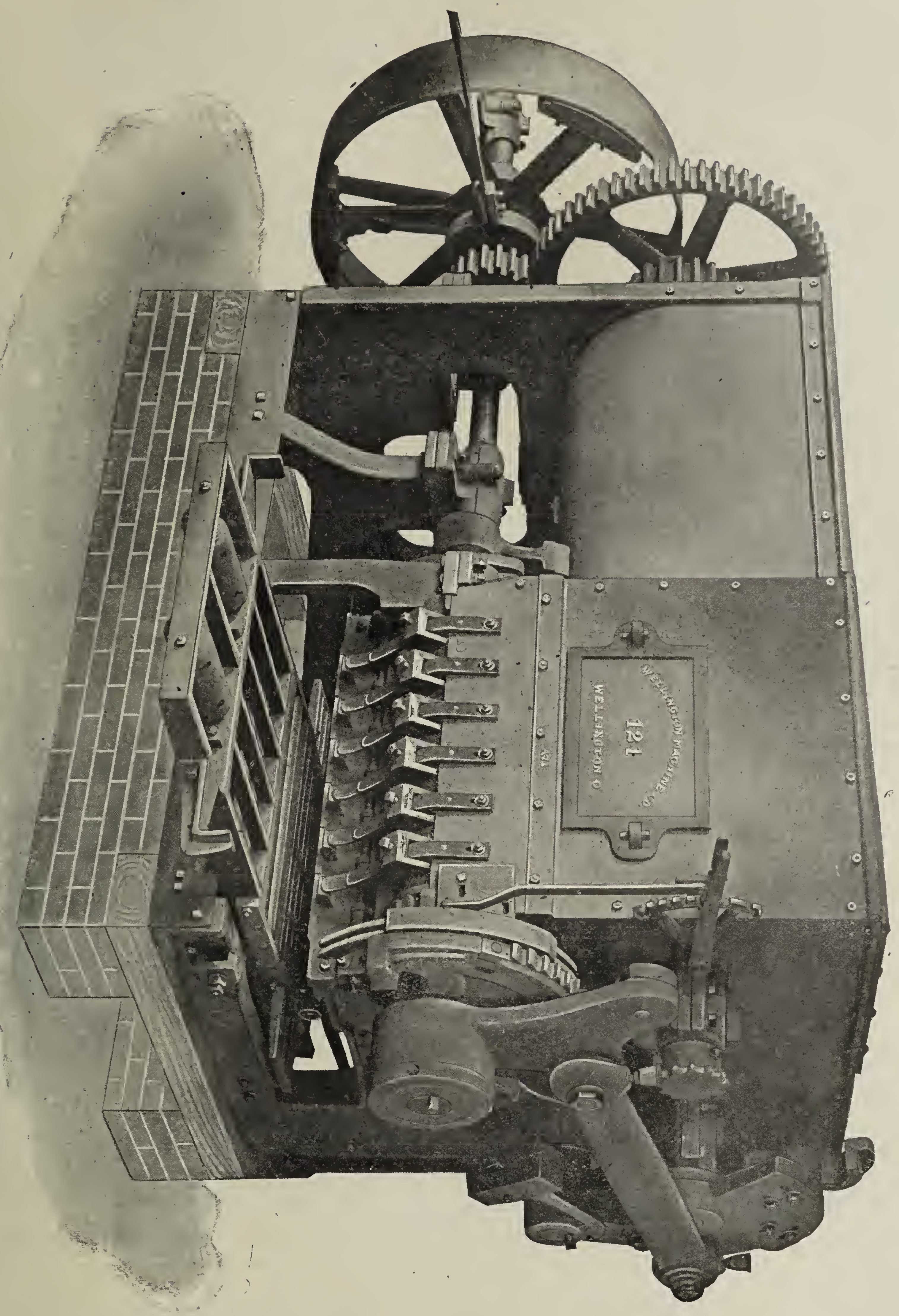
Winding
Drums,
Dump Carts,
Elevators,
Dump Tables
and all
kinds of
Kiln
Castings.



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You are losing
money wheeling
brick unless you
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BARROWS.

The Wellington Machine Co.,

WELLINGTON,
OHIO.

Send for Catalogue.

EDITORIAL NOTES AND CLIPPINGS—Continued.

of the sand-lime brick business in the way of orders for presses for making the sand-cement brick and cars for sand-lime brick.

C. W. Williams has his new brick plant at Bonifay, Fla., now well under way, and is well pleased with the success of the enterprise.

The Standard Brick and Oil Co., has been incorporated at Point Lookout, Tenn., by A. E. Enochs and others, with $30,000 capital stock.

The Industrial Brick Co.'s plant at Mt. Vernon, Ind., was badly damaged by fire which started from sparks from a kiln. The loss is estimated at $3,000. The burned portion will be rebuilt immediately.

The Orchard Knobs Clay Works has been incorporated to manufacture brick at Ironton, Ohio, with $80,000 capital stock. T. J. Gilbert, A. K. Johnson, C. A. Hutsinpillar, C. Edgington and F. C. Tomlinson are the incorporators.

The Brenham Pressed Brick Co. has been chartered to manufacture all kinds of building brick and block and tiles at Brenham, Texas. J. H. Simon, C. G. Botts and Robert Strickert are interested. They have $50,000 capital stock.

The Berkshire Pressed Brick Co. has been organized at Springfield, Mass., to manufacture brick by the Huennekes process. They have $150,000 capital stock. They expect to be in full operation by February 1, turning out 20,000 brick a day.

The explosion of a gasoline torch in the dry room of the Charles Taylor & Son's brick plant, near Cincinnati, Ohio, October 19, resulted in a dangerous fire, the destruction of $20,000 worth of property, and endangered the lives of many employes and firemen.

The E. C. Tecktonius Manufacturing Co., has just received an order for 24 set of 4x¼-inch kiln band lugs from the Conkling-Armstrong Terra Cotta Co., of Philadelphia, Pa. This is their second order, which is satisfactory proof of the qualities about which Tectonius crows.

The Baltimore (Md.) Vitrified Clay Co. has their new brick plant at Westport, Pa., almost ready for operation. The plant will have a daily capacity of 50,000 brick at the outset. C. C. Bartgis is president, Roy Carter secretary, Dr. M. H. Carter treasurer and J. M. Highhouse superintendent of the concern.

Benjamin Hendrix, an employe at the McRoy Clay Works, was fatally crushed between railroad cars as he was leaving the yard after quitting work in the evening. Several men had passed through the cut of cars, and just as Mr. Hendrix was passing through a switch engine bumped into the cars and he was crushed between the bumpers.

The Sharp Sand Brick Co., with $100,000 capital stock, has been incorporated, with headquarters at Columbus, Ohio. The incorporators are E. W. Swisher, S. J. Scott, E. E. Beckett, R. A. Sharp, F. Humphreys, C. W. Herb, E. W. Newman, A. R. Ruth and David Seltzer. They will manufacture brick from a composition of which red sandstone will be the principal ingredient.

James C. Harris, an old and well-known brick manufacturer of Zanesville, Ohio, died at his home in that city October 20. Mr. Harris was for many years connected with the Harris Brick Co., but, on account of failing health, had not taken an active interest in business life for some time. He was 74 years old, and had spent his entire life in Zanesville, the place of his birth. He leaves four daughters, one brother and one sister.

In renewing his subscription to THE CLAY-WORKER recently, Mr. M. L. Runkle, Los Angeles, Cal., says: "I am very much pleased with THE CLAY-WORKER, especially with the World's Fair articles which have appeared in same. The practical clayworker should keep posted on all things pertaining to his trade; in order to do this he should read his trade journals, and THE CLAY-WORKER is the best paper devoted to clayworking that I have seen."

Henry Panke, George Feldman, Christ Miller and W. P. Miller, minority stockholders in the West Broadway Brick Co., Louisville, Ky., have filed suit against that corporation asking for a receiver and charging that George Nagel, Sr., George Nagel, Jr., and J. W. F. Selke, who hold the majority interest, are trying to bring about a forced sale, which will result in great sacrifice of the company's assets and loss to the plaintiffs. Neglect of business and failure to keep proper accounts are charged. It is further alleged that Philip Stammel, the company's president, is absolutely unqualified for that position, because he holds no stock and is not a member of the board of directors. The company is capitalized at $30,000, of which only $19,400 worth is outstanding and the rest treasury stock. Of the total stock issued the plaintiffs say they have $7,600 worth. It is alleged that the plant and ground are worth $20,000, and that when running at full capacity can make a large quantity of brick.

The Standard Brick Co.'s plant at Milwaukee, Wis., was damaged to the extent of $600 recently by a fire which started in the boiler room.

The Gaston Tile Company has been chartered to manufacture tile at Gaston, Ind. The directors are B. A. Brown, L. F. Miller and Josiah Ferguson.

The York Brick and Tile Co. has filed articles of incorporation at York, Neb. Charles A. McCloud, Herman Behling, C. A. Schrandt, E. B. Woods, Thomas W. Smith and George W. Post are the incorporators.

E. L. Williamson & Co., Lynchburg, Va., report a very gratifying trade the past season. They have been running full-handed straight through the year, and have orders enough ahead to keep them running for months.

Colonel J. C. Fuller, one of the most prominent men in Central Pennsylvania, died October 19 at his home in Pine Grove Furnace, Pa. Mr. Fuller was president of the Fuller Brick Co. and identified with a number of other business enterprises.

Joseph M. Bauman, a member of the firm of the Allegheny Valley Brick Co., Pittsburg, Pa., died at the Allegheny General Hospital, October 10, of Bright's disease. Mr. Bauman was a resident of Sewickley, Pa., and had been in the hospital about two weeks. Two daughters survive him.

The plant of the Chicago Hydraulic Press Brick Co. at Porter, Ind., was almost completely destroyed by fire October 20. The fire is supposed to have started from sparks from a passing locomotive. The loss is estimated at $50,000, on which there is a small insurance. The plant will be rebuilt at once.

The South Amboy (N. J.) Terra Cotta Co. has had a very busy season. They write that they now have on hand contracts to supply terra cotta for the new postoffice building at Norwich, Conn., for the new St. Joseph's Normal College at Pocantico Hills, N. Y., for a theater and clubhouse at Peekskill, N. Y., besides many smaller contracts throughout the State of New York.

The E. C. Tecktonius Manufacturing Co., of Racine, Wis., has recently furnished the National Fire Proofing Co., of Keasbey, N. J., with 107 set of 5x3-16-inch kiln band lugs. The Tecktonius lug is proving itself to be a money-saving device and many prospective kiln builders are taking advantage of this improved band coupling on account of its cheapness, neatness and its durability.

The Washington Brick, Lime and Manufacturing Co., Spokane, Wash., has purchased the steamer City of Hope, on Lake Pend d'Oreille, to handle goods from the company's works at Bay View to Hope, where connections are made with the railroad. The distance from Bay View to Hope is about twenty-six miles, and besides towing barges between the two places, the steamer will engage in the passenger service to a certain extent.

F. W. Dennis, the kiln man, Atlanta, Ga., writes that he is having splendid success in the introduction of his kiln, which he claims is exceptionally adapted to the needs of practical men. Among firms to whom he has recently made sales are the Peninsular Brick Co., Salisbury, Md.; Pierpont Brick Co., Salem, Va.; Jeffrey & Ricks, Rocky Mount, N. C.; Keller Brick Co., Cuyahoga Falls, Ohio, and William Collins, Norfolk, Va.

In the write-up of the Ittner Brick Co.'s plant at Belleville, Ill., in our October issue, the statement was made that they were using four "Andrew's" presses. This was an error. The presses used at the Ittner plant are the Andrus press, and there are seven of them now in use. This is the "Press that Scott Builds," made by the Scott Manufacturing Co., who have recently opened their main office in the Commonwealth Trust Building, St. Louis, Mo., where Mr. William F. (Dixie) Scott, the president of the company, or Mr. Peter F. Gibson, the secretary, will be found at all times ready to extend the "glad hand" to all visiting clayworkers.

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THE CROSSLEY MFG. CO.

Manufacturers of
Pottery Machinery.
Clay Washing Machinery.
Porcelain Machinery.
Tile Making Machinery.

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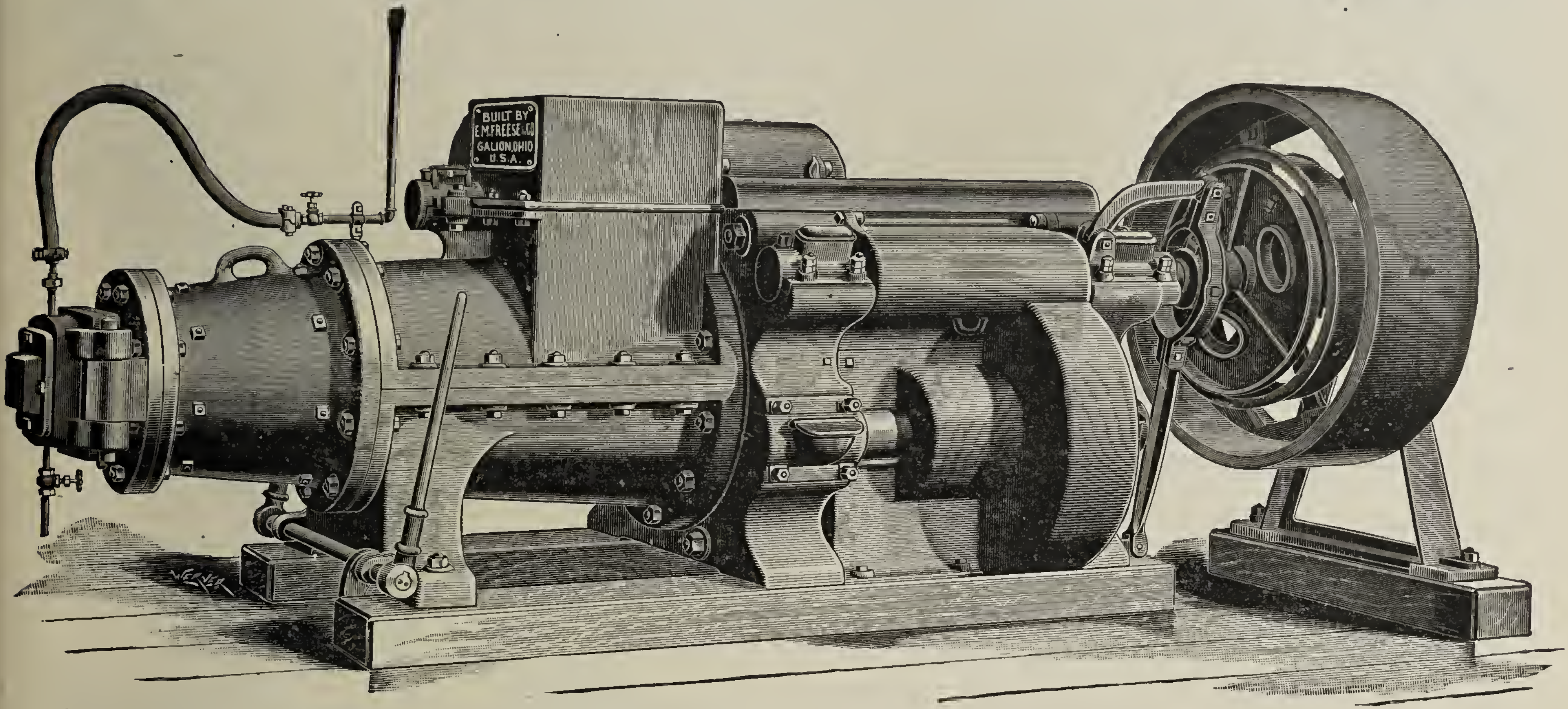
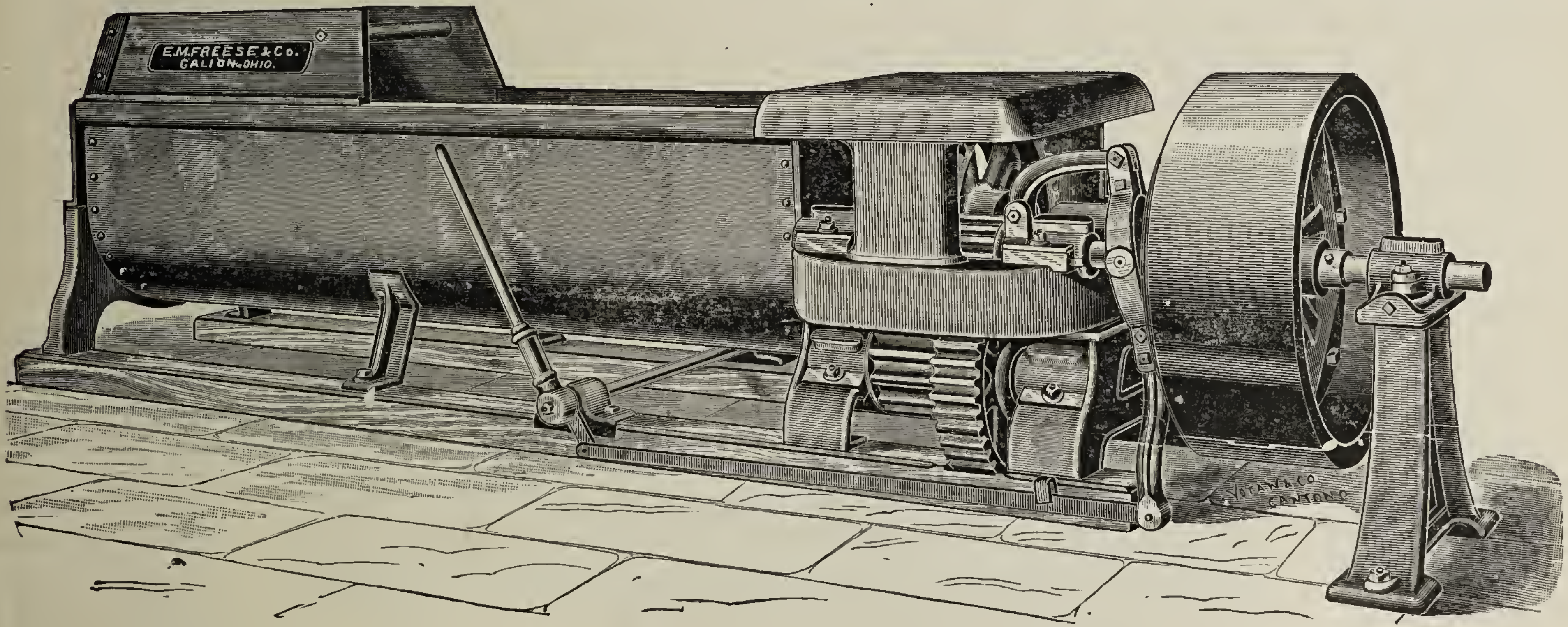
Our Mammoth Brick Machine



THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

Our Pug-Mills Have Features of Great Merit.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GALION, OHIO.

THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 536 and 537.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE CONDITIONS of business are in better shape at the present time than they have been for a month past. Building contracts are frequent, and the feeling in all lines of business is for investment and progress. The unusual quiet in nearly every line of business, which for a while was everywhere evident during the summer, is a thing of the past, and the outlook is bright for good conditions during the winter.

Gladding, McBean & Co. have finished a high-tension station in white enamel brick and white enamel tile for the San Francisco Gas and Electric Company. It is one of the finest of its kind in the country. Mr. McBean, of the company, is at present on a European trip. He will return by the first of the year.

M. A. Murphy, of the Carnegie Brick and Terra Cotta Company, reports that manufacturing continues to the fullest capacity, and that they are selling all they can make. Trade is good, he states, in sewer pipe, flue lining and chimney pipe, and also in their brick, both face brick and fire brick. They are now running their twenty thirty-foot kilns up to the full capacity continuously, and are now building eight muffled kilns for architectural terra cotta. These kilns they expect to have in operation by the end of the year.

The Steiger Terra Cotta and Pottery Company has its hands full of work. Among contracts now being completed are: Terra cotta for the Los Angeles Furniture Company building, Los Angeles, Cal.; red pressed brick for the Mutual Electric Company's building, San Francisco; terra cotta for the Charles Carpy building, San Francisco; architectural terra cotta for St. Patrick's Seminary, Menlo Park, Cal.; residence of L. A. Lewis, Portland, Ore.; terra cotta for the C. M. Bolkman building, San Francisco; terra cotta for addition to Santa Cruz court house, Santa Cruz, Cal.; architectural terra cotta for the Scott & Van Arsdale building, on Stockton street, San Francisco, and for T. W. Corder, San Francisco.

Henry Gray, of Gray Brothers, of the San Francisco Brick Company, is making a trip through the Eastern States.

Probably the biggest building to be built in San Francisco next year is the Shreve building, for which the foundations are now being laid. This building will be erected by the Crocker estate. It will be built of ornamental pressed brick and terra cotta, for which contracts have not yet been let.

Thomas Sexton, an extensive brick manufacturer of Chicago, has arrived at Ocean Park, Cal., with his family, and will hereafter make his home there.

Bloom & McVicar, of Corona, Cal., have the contract to furnish the Los Angeles and Corona parties with clay from their deposits on Harrington Hill.

C. A. Murphy, manager of the Carnegie Brick and Pottery Works, has been in Hanford, Cal., recently.

J. S. Schirm, of San Diego, Cal., has been awarded the contract for furnishing sewer mains to the city of San Diego, the contract amounting to about $18,000.

The Triplet Brick Company, which now has a large brick plant near Spokane, Wash., is considering the matter of installing a plant at Rockford, Wash., provided that the clay found in the latter place is suited to their needs.

The Los Angeles-Pacific Company is under contract to deliver 2,000,000 brick from Los Angeles to Venice, Cal., where they will be used in the construction of buildings.

The Pacific Clay Manufacturing Company, of Corona, Cal., has the contract to furnish Los Angeles, Cal., with several miles of sewer pipe of different sizes.

The case of the Los Angeles Press Brick Company vs. W. G. McVicar, which was recently brought up in the Superior Court at Riverside, Cal., has been ordered dismissed upon the payment of $114.60 by the plaintiff for the defendant's costs in the action.

G. M. Crowley, representing a Chicago firm, is in El Paso, Tex., looking over the prospects there for starting a tile plant, to manufacture pipes for sewerage, irrigation and water purposes.

The Wilson-Lyon brick manufacturing plant at Point Richmond, Cal., has resumed operations again, after being closed for several days to repair damages caused by the storm.

San Francisco, Cal., Nov. 5, 1904. SUNSET.

OBVIOUSLY BENEFICIAL.

VISITOR—"I trust you will profit by this experience."

FOOTPAD PETE—"Sure! De next time I won't tackle such a big feller." —Judge.

Books for Brickmakers

"CLAY GLAZES AND ENAMELS," H. R. Griffen.................... $5.00
"BRICKMAKERS' MANUAL," Morrison and Reep.................... 3.00
"BRICKMAKING AND BURNING," J. W. Crary, Sr.................... 2.50
"TABLE OF ANALYSES OF CLAYS," Alfred Crossley.................... 1.00
"VITRIFIED PAVING BRICK," H. A. Wheeler, E. M.................... 1.00
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INDIANAPOLIS, IND.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XLII. INDIANAPOLIS, IND., DECEMBER, 1904. No. 6.

Written for THE CLAY-WORKER.

A BRICKMAKER ABROAD.

CONSTANTINOPLE.

LEAVING ATHENS, the "Grosser Kurfurst" sailed through the Aegean Sea, northeast-bound, for the Ottoman Empire. The entrance to the Dardanelles is guarded on either side by numerous cannon.

The land showed less signs of verdure as we proceeded north and was less interesting than the shores of Greece. At 3 p. m. we came in sight of the many gilded domes and minarets of Constantinople. Stamboul, Galata and Skutari, really three cities, are separated by the Golden Horn and Bosporus and together are said to have a million inhabitants. Constantinople was the only port after we left New York where the water was of sufficient depth to anchor our ship at the dock.

Wondering why such crowds of people were at the wharves, we learned that ours was the second largest vessel that had ever visited these cities. The "Celtic," which had made the same cruise two years before, was larger, but had fewer passengers. Turkish officers came on board in the evening, and for the first time we were required to give up our passports, which were kept by them until we sailed away three days later.

Mosque of St. Sophia, Constantinople.

The first thing that impresses the visitor, and that all travelers tell about, are the dogs of Constantinople; and there they were, seemingly awaiting our arrival. They are of one breed—curs—about the size of the Scotch collie, but looking like wolves. These dogs belong to no one, but are the scavengers of the city They lie around in the daytime, until at 9 p. m., when the garbage is thrown out, then the howling commences and night is made hideous. No one is allowed to molest these animals, and instead of the dog getting out of the way, it is the pedestrian that gives up the sidewalk. Further, these canines stay on their own territory, and should a dog stray off the square in which he belongs his case is quickly attended to by the ones that occupy that quarter. As many as twenty-five were frequently seen in one place.

Next morning all was hurry and excitement among the passengers to get ashore. The "hostile Turk" was forgotten and anxiety to explore and penetrate the hidden mysteries of the city seemed to possess each soul on board. None felt afraid. Why, we were from *America!* Carriages were waiting and the guides and drivers were shouting like mad.

The pulling and hauling made one dizzy, but at last, with a sigh of relief, we were settled in a carriage and started in the procession. It was a narrow street and uphill. We soon observed that horses are pretty much alike the world over, as one of ours was making us conspicuous, and you might say obnoxious, by absolutely refusing to pull. If there is anything that agitates and really provokes it is a balky horse in a procession where the street is too narrow for carriages to pass. In the first available space we turned back and secured another carriage. It was a fine exchange, for this time we had a splendid team and a new carriage. The driver was a perfect Jehu. All day we imagined we were chief performers in Buffalo Bill's Wild

West show, as our chariot passed everything in the *ring*. We were first at the Museum, first at the Treasury and far ahead of any one at the Palace. It was a thrill of excitement the day through. The Museum contains many rare and highly valuable relics, among which is the sarcophagus of Alexander the Great and that of his wife. The carving in bas-relief is magnificent on both. At the Treasury, coffee and rose jelly were served. The building, instead of being the mint or money department of the empire, contains trophies taken in war and articles of great value received as presents by the Sultans. These consist largely of swords studded with jewels, crowns, robes, thrones, plate, etc., worth many millions of dollars. As stated, we were far in advance at the Palace and had an opportunity of watching the army officers as they passed in and out the gates.

IN THE SULTAN'S PALACE.

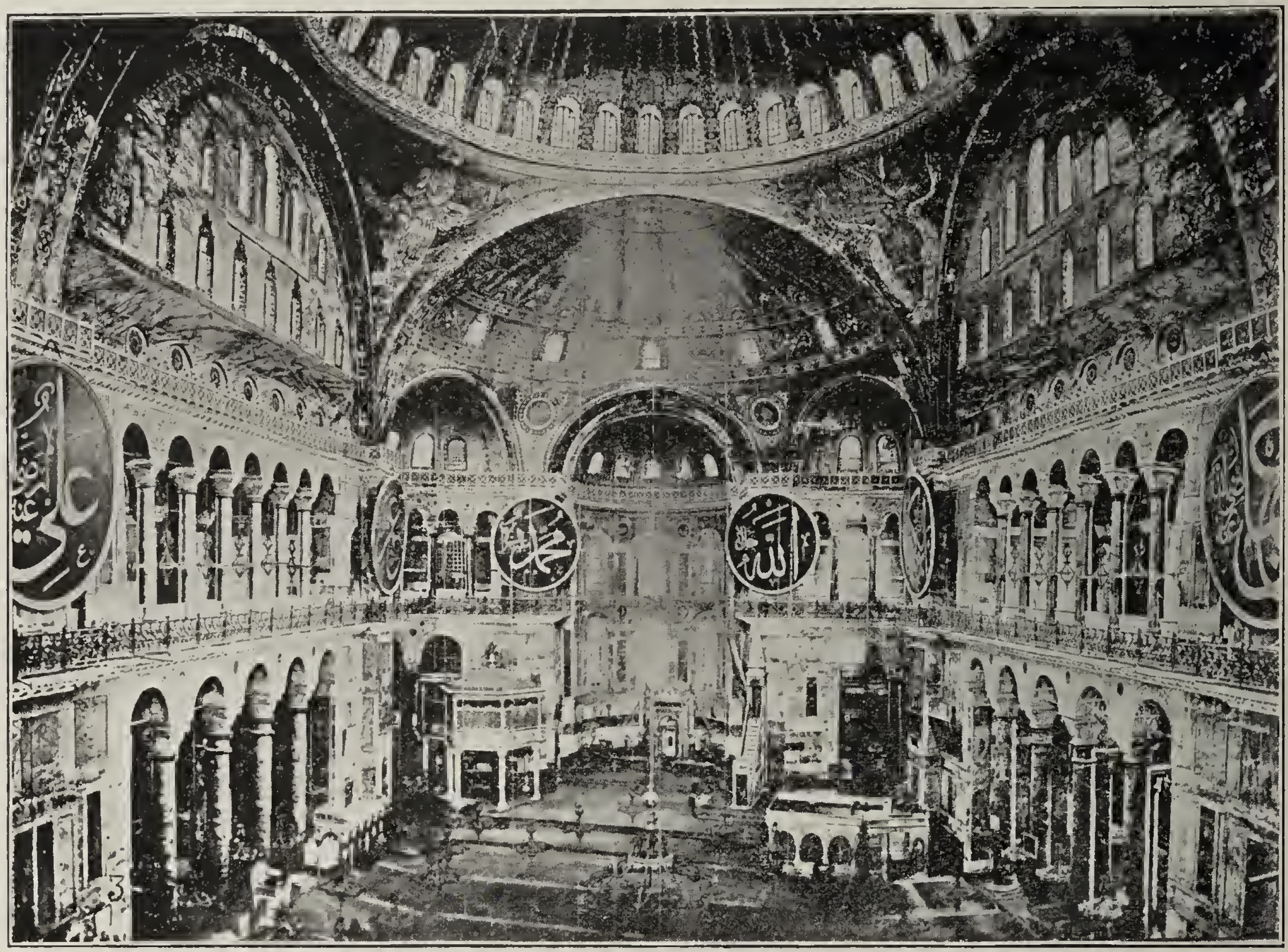
Each Sultan perpetuates his memory by building a palace and a mosque. This most splendid palace was built by the present Sultan's father and cost many millions. Because of this the empire was bankrupted and the Sultan was assassinated soon after its completion. We were finally admitted. The vastness of the halls, the size and number of the rooms were bewildering. The carpets, draperies and furniture were gorgeous. This might be expected in the land which produces our richest furnishings. The woodcarving and upholstering are handsome beyond description. There was that about the decisive coloring of the frescoing and its harmonizing with the size and purpose of the room that gave a most pleasing effect. One of the immense chandeliers was a gift from Queen Victoria. A large bath room, entirely of alabaster, the fireplaces, mantelpieces and ornaments were beautiful in the extreme. Our guide well understood the art of showing us the wonders of the Palace, reserving until the last the ball room, which eclipsed all we had seen before. It is 100 feet square, with a dome 80 feet high, supported by 64 marble columns. From the center of the dome was suspended a massive chandelier of glittering glass that was at least 18 feet across. It was in this room that the frescoing was richest and showed to the finest effect.

After furnishing the necessary perquisites we were allowed to pass through the art gallery. This was a long hall, with pictures as close as could be hung on each side. It was a chaste collection of oil paintings, portraits of men, battle, marine and pastoral scenes.

The next point of interest was the mosque of St. Sophia. This mosque was first erected by the Emperor Justinian on the site of one built by Constantine, and is one of the finest examples of Byzantine architecture. It is said to have employed 10,000 workmen under the direction of 100 master builders.

It was converted into a mosque by Mahommet in 1453. The building is 235x250 feet. The dome is raised at the center 180 feet and has a diameter of 107 feet.

The principal material of the wall is brick, but the interior is lined with marble. Columns from Athens, Ephesus, Baalbek and other ancient temples were confiscated to add to the splendors of the edifice. The Mohammedans have painted over the figures of Christ and His apostles and hung oval frames with Arabic inscriptions over the Christian emblems. As in Algiers, we were required to shuffle through this immense building, not daring to lift a foot lest we walk out of our slippers. There are 400 mosques in Constantinople, but St. Sophia was the only one visited.



Interior of St. Sophia Mosque, Constantinople.

The German Emperor presented to the city a very handsome fountain, which occupied one of the prominent places—another bouquet from an European Power.

The bazaars have a fascination for the tourist, and in no other city were they so attractive as in Constantinople. Covering three miles of streets, these little shops offer everything conceivable for sale—handsome rugs, beautiful embroideries, rich tapestries, dainty china and bric-a-brac of all descriptions. Hours could be spent in these fascinating places.

After a ride up the Golden Horn that a view of the shipping and many points of interest might be had, it was continued five miles up the Bosporus to Robert College. This institution is owned and supported by the American Board. When the stars and stripes came in view floating above the college on the shores of the Bosporus, a wave of patriotic enthusiasm swept the American visitors. Cheers, with the waving of hats and handkerchiefs, were responded to by the students. Below the college are to be seen the walls and towers built by Mohammed II, 1451-1481, in a fair state of preservation. The college had 400 students, and they were an intelligent, fine-looking body of young men. Their graduates are filling positions of trust in all parts of the Orient. I cannot but mention a recent legacy left Robert College by one of its first graduates, Mr. Arslau Sahagian, an Armenian. At his death in Yonkers, N. Y., be bequeathed his entire fortune, $80,000, to the college, the strongest possible testimony of his appreciation, gratitude and confidence in this mission. The building is well equipped and has able instructors.

The Turks are Asiatic, not European, and speak Arabic. The Turkish government is a despotic monarchy. Its head is the Sultan, and he is also the head of the Mohammedan religion everywhere. The entire empire is under military rule. Soldiers patroled Constantinople, and throughout Syria and Palestine Turkish soldiers were evidence.

Taxation is a system of squeezing from the individual as much as possible. The rate imposed upon the produce of the soil is 10 per cent. and sometimes as high as 14. Not infrequently onethird the produce is levied. This does not include the animals raised or personal property. Any of these impositions is liable to arbitrary increase any moment.

The dress of the men was not different from that worn in the United States with the exception of the fez, and, although prejudiced against these Christian-hating Mohammedans, we are forced to admit them to be the finest-looking men seen on our journey. The soldiers of Constantinople wore handsome uniforms and rode their spirited horses as though a battle was pending.

The men are burden-bearers, although oxen, horses and mules are used in heavy traffic.

A NOVEL WAY OF HAULING BRICK.

It is surprising to see building brick conveyed through the streets by means of slings thrown over the donkeys' backs. Each donkey carried in this way about fifty bricks at a time, as near as we could judge. The brick are rather small and of a grayish color. Constantinople has many brick buildings, but no brick streets. Most of the streets are of cobble-stones, narrow and filthy. The Turks are aliens to civilization and not a street car was seen in this great city. Not a telephone or electric light in the empire; in fact, the Turks are opposed to modern improvements. No more interesting city was visited, but we were not sorry when anchor was hoisted and we sailed up the Bosporus into the Black Sea. Returning the same way, gave another opportunity for a last look at the palaces and towers, the domes and minarets.

(To Be Continued.)

CONSTANTINOPLE. (1) Dogs at the Wharf. (2) Fortifications Built by Mohammed II on Shores of the Bosporus. (3) A Burden Bearer.

THE CLAY FIREPROOFING INDUSTRY OF NEW JERSEY.

At the present time New Jersey's production of fireproofing material is valued at $1,000,000 or more, annually, and in 1902, this State made over 30 per cent of all the fireproofing made in the country, says the Camden (N. J.) Courier. There are now nine factories whose output is largely or entirely of this material, and several other factories which make some grade of it in connection with other clay products. The center of the New Jersey industry is in the vicinity of Perth Amboy, where vast amounts of suitable clay can be cheaply obtained and where there are excellent shipping facilities by rail and water. Other large factories are located nearby, at Woodbridge and South River, in Middlesex county; at Lorillard, in Monmouth county, and Port Murray, in Warren county. At the latter plant a hard shale is used instead of clay. At several places enormous pits have been excavated, the clay being dug with a steam shovel and the clay hauled to the works on cars. The location and extent of these openings can be seen on a map which accompanies the report on the clay industry, recently issued by Dr. Henry B. Kummel, the State Geologist, but owing to the rapidity with which the clay is being dug the outlines of the pits have changed materially in the short time since the survey was made.

A copy of the report can be obtained from the State Geologist upon application.

FOR FIRE ALARMS IN HOTELS.

The Police and Fire Dispatch, referring to the precautions taken to prevent panic, suffocation and death in the new Hotel Astor (New York), in case of fire, says:

"Besides the usual fire appliances and alarms on every floor, each guest room is provided with an automatic fire detector service, which notifies the office if the temperature reaches 130 degrees. Modern experience and investigation have proved that in the vast majority of cases people do not perish in accidental fires through the flames and heat, but lose their lives through suffocation. It was with these facts in mind that each floor has been divided into sections, and isolated from all other floors by fireproof inclosures round the stairways and elevators. At the first sign of alarm the doors to these are closed, but not locked, by the turning of a lever in the office, thus cutting off each floor from the others, and insuring the confinement of any fire and smoke to its original source. This is the first hotel wherein this principle has been applied."—*Fireproof Magazine.*

Written for The Clay-Worker.

CHEMICAL FORMULAS AS USED BY CLAYWORKERS—THEIR MEANING AND USE.

—FIRST PAPER.—

BEFORE ENTERING upon our subject proper it may be of interest to note that the world of our day owes, in some sort, a vast debt of gratitude to the foolish alchemists of old whose long search of many hundred years for the philosopher's stone and the elixir of life kept alive the feeble and widely scattered fires of chemical science, which would otherwise have inevitably have been extinguished—perhaps forever.

To-day those charlatanical chemists of gone-by centuries lie all forgotten in their lowly tombs beneath the shifting sands of Arabia and Egypt. They are sleeping in dreamless oblivion under the desolation of a rainless sky, while the blighting simoon winds moan over their graves an undying requiem. Here let us leave them before their hypocrisy and, in many cases, their diabolical wickedness rise up to make them and their works hateful. The magic that they wrought and with which they terrified the half-savage, superstitious folk of their day has given way to a magic greater by far than any they had ever ventured to dream of, even in their wildest flights of fancy.

At the beginning of the sixteenth century, when Parocelsus declared that the true use of chemistry was not to make gold, but to prepare medicines, we may mark the beginning of a true appreciation of the manifold uses of chemistry in the daily affairs of life; but it was not until near the end of the eighteenth century, when Lavoisier reorganized the science, that the faint and smoldering sparks of chemistry, which had been, one might say, so miraculously preserved throughout centuries of benighted turbulence, were finally kindled into a flame which has grown with ever-increasing volume and intensity until now, on the threshold of the twentieth century, every department of the world's work is illuminated and brightened by its radiant brilliance—and none more so than the great brick industry.

It is true that bricks—and good bricks, too—had been manufactured before the science of chemistry had emerged from its embryonic stage, but we may with undoubted justice liken such brickmaking to the visionless gropings of a blind man, who will follow quite successfully a well-worn pathway for a time, but whose progress is very slow and uncertain and whose faltering footsteps are very apt to wander off the beaten track into the weeds and thistles that grow abundantly on either hand. Once astray among these the aid of some good-sighted passer-by is invariably required to set him right again. However, it will suffice to say that the debt which the clay industry owes to chemical science is incalculable, and it behooves the clayworker of to-day, if he wishes to keep up with the van of progress, to familiarize himself thoroughly with its principles, especially those that apply particularly to his craft. To do this it is first essential to understand fully the method of indicating, or expressing a chemical substance.

In the olden times substances were given names according to the fanciful theories of alchemistry, but in 1787 Levoisier devised his system of nomenclature, which has formed the basis of that in general use to-day.

Lavoisier, however, made the mistake of attempting to give to both simple and compound substances names that could be regulated by system in such a way that the name would indicate the origin or the predominant qualities of the substance. For example, the familiar oxygen was then regarded as an essential ingredient of every acid, whence its name, oxygen (*oxus,* sharp, acid, and *gennao,* to produce, to be born; hence, acid-producing). This practice, however, has long since been abandoned, and the more rational method of denoting only the compound substances by a systematized notation has prevailed. Consequently, the chemical name of an element, or simple substance, may be regarded simply as a designation conveying no scientific meaning whatever. In many cases the more common of the elementary substances still retain the names by which they were originally known; such as gold, silver, etc.

Before proceeding further with our subject it might be well to introduce here a few chemical definitions in order to make clear what is to follow.

Chemistry, as we all know, is the science which treats of chemical actions and chemical changes.

A chemical action may be defined as any action which produces a change in the chemical condition of matter. This action takes place in two ways: First, decomposition, the division or separation of a substance into other distinct substances; second, recomposition, the combination of two or more substances to form a new one.

Should the process of decomposition of a substance be continued a sufficient length of time, this substance will ultimately be separated into other substances which cannot be any further divided. Such ultimate substances are termed elements, and to whatever degree of fineness the separation be carried each particle will still retain the same nature as when combined with the other particles of the same element.

We are now ready to comprehend what a chemical change is. Briefly, it may be a decomposition or recomposition of some substance. For instance, when iron is exposed to the weather it becomes coated with a yellowish substance commonly called rust, which, to the outward appearance, does not in the least resemble iron. This change is one of chemical change, and by means of chemical analysis it is shown that it consists of the addition of oxygen to the constituents of the metallic iron.

Another illustration of chemical change, perhaps equally as familiar to Clay-Worker readers, is that of coal burned in the furnace, leaving nothing but clinkers and ashes. This change is due to the oxygen of the air combining with the carbon of the coal. This combination of oxygen with other substances forms compounds termed in chemistry oxides.

These oxides are sometimes solid and sometimes gaseous, oxygen possessing the important quality of uniting with all the other elements, with a single exception, to form compounds. It is the most widely diffused and most abundant of all known substances. Not only does it constitute about one-fifth the volume of the earth, but at least one-third of the solid crust of the globe is composed of it. It is the principal ingredient of water. Silica, in all its varieties of sand, clay, flint and quartz, marble, chalk, etc., contains about one-half of its weight of oxygen. Its combination with the various substances is often accompanied by the production of light and heat. All the ordinary phenomena of fire and light which we daily witness depends upon the union of the body burned with the oxygen of the air.

These changes include both decomposition and recomposition of the various constituent substances, and hence are all chemical changes in contradistinction to physical changes. A physical change implies that no change is produced in the constitution of the substance. We may take a lump of clay and reduce it to powder and each minute granule is still a bit of clay, although a change has been made by which the single lump of clay has been converted into perhaps thousands of minute lumps of clay.

The clay from the bank, throughout the various operations of pulverizing, mixing and molding and drying, is clay up to the time of setting the green bricks in the kiln. In all these processes through which it has passed up to the time of burning the changes have been external and non-essential and are called physical changes. The high temperature to which the clay is subjected in burning produces, however, a change in the constitution of the clay composing the brick and must therefore be classed as a chemical change.

To analyze and classify these changes, to investigate the action of each different clay under the influence of heat, to study the properties of the material resulting from this action, to resolve the various clays into their simple constituents, and to deduce the natural laws by which the reaction of clays on one another are controlled are some of the duties which confront the investigator in the ever-widening fields of the clay industries.

A chemical compound is the union of two or more elements to form a new substance. Compounds may be formed by the union of two or more compounds, but this is merely a new union of the elements which originally formed the uniting compounds.

There have so far been discovered about seventy-two elements; that is, substances that have defied all known methods of decomposing them into other elements. However, other elementary substances may be hereafter discovered and substances now regarded as elements may at some future time be resolved into still other substances so that the number of the substances considered as elements is subject to change. For it is the constant endeavor of the chemist to pull to pieces or, in technical language, to analyze every natural substance with which he is confronted. If he is successful in decomposing a substance which has never before yielded to chemical analysis, he is happy since he knows his name will be written in unfading characters in the Valhalla of chemical history. If he does not succeed in decomposing the body by any method of analysis, the substance must be regarded as being already at its simplest, and the disappointed investigator must seek elsewhere for imperishable glory.

At this stage in our writing the term chemical action again rises phantom-like before us, and like Banquo's ghost it will not down; hence, we may as well confess at once that its exact nature is not known any more than is the exact nature of electricity or heat. But it is similar to these phenomena in that it is a manifestation of energy. This energy is stored up apparently in the atoms of the elements as potential energy and causes such atoms to have an affinity for or tendency to combine with other atoms, this affinity being greater or less according to the relative amount of potential energy stored in the combining atoms. Under the proper conditions these affinities cause the atoms to combine, which permits their potential energy to appear as kinetic energy; *i. e.*, active energy, usually in the form of heat. Thus chemical combination produces kinetic energy, while to accomplish chemical decomposition kinetic energy must be supplied. The heat given out by the union of two or more substances to form a compound is known as the heat of formation of that substance. The amount of this heat has been calculated in the case of a few substances, and tables giving these values are published in most advanced works on chemistry.

(*To be Continued.*)

Written for THE CLAY-WORKER.

CAPITAL BRICK AND BUILDING NEWS.

Things of Particular Interest to Clayworkers.

"THINGS ARE QUIET along the Potomac now," in the brickmaking and building line, and activity in these particulars has given place to the industry of looking after the public weal—including brick and other structures—in the great law-factory, the U. S. Capitol. The clayworkers who are not turning out material are getting ready for the "spring rush," and Congress is getting ready to spend some millions of money in the way that each year helps the clayworker. And this is no small affair to the latter.

The recent report of Mr. J. K. Taylor, supervising architect of the treasury, shows that expenditures for the last fiscal year on buildings amounted to over $10,064,000 and the contract liabilities to more than $13,692,893. During the past year fifteen new buildings were completed and seven extensions added to old ones. Thirty-three new buildings have been contracted for, and the whole number now under construction is fifty-three. Improvements in Washington, under Treasury supervision, were mainly for the Bureau of Engraving and Printing, a marine hospital laboratory, the proposed Hall of Records, the Bureau of Standards and for Treasury sewers and vaults.

Uncle Sam has become so very wealthy that new vaults to hold and keep safely his hoard of precious metal and valuable "rags" are necessary. The old gentleman's mind is now at rest; his strong-box is fully equal to the inflowing streams of yellow, white and green, and as to its safety from burglars, nothing short of an army with dynamite guns could burgle it. Through the vast halls of the Treasury, brilliantly lighted by electric lamps, armed guards walk, and electric alarms at certain stations and connected with the treasure vaults also keep guard. But the position of watchman here is trying on the nerves, so 'tis said. Anyhow, a guard was missing some time ago, and when search for him was made his dead body was found in a dark, lonely cellar of the building. He had committed suicide.

Of course, the Treasury's architect's report does not include general building affairs in the District of Columbia. These matters I have just obtained from the D. C. office. The estimated value of buildings constructed here during the past fiscal year is $13,017,575 (including the Union Station), an increase over the preceding year of $1,432,972. The number of dwelling houses built was 1,144 and 72 apartment houses. The increase in the latter over last year's output was 32. Brick dwellings were 939 in number. There are 46,468 brick buildings in the District and 20,961 frame.

It will be seen from this that the apartment house still is with us—and growing. Not any higher, for Congress said that structures on residence streets should be kept down to a height of not more than 80 feet for the fireproof kind and to 60 feet for the non-fireproof. And this solves an economic problem: If you wish to be cremated, take the 60-footer; if partly roasted, the 80-foot dwelling, for in the latter you can jump out a window or down the elevator shaft and be sure of being killed instantly. The really fireproof building—of brick, with these wherever one can be put, and without wooden floors—is very hard to locate. Still the residence, office and factory "crematory" can be abolished, and will be when the Christian, humane idea overcomes inhuman greed. Material for efficient protective structures can easily be found; let the legislator find the courage and determination to see that it is used.

Navy Yard Forge Shop, Where Brick Undergo Severe Heat Tests.

Yes, there is a decided disposition in the people of the Capital City to herd in the "general home," where all can shout down the elevator hole and the dumb-waiter, where everyone can tell what the other one has for dinner by the odors that fight together in the halls, and where the janitor is king. Of course, there are in this city apartment houses where conditions described do not prevail, but the grand structure is not for ordinary folks,

But for people who make both ends meet—
And lap a long way over—
Who, having what is best to eat,
Live *in*, but not *on*, clover.

The question of the party-wall outside of Washington, in the District, has lately come before the D. C. office. Here again the desire to economize is pushed in the wrong direction. In a crowded city the party-wall is, on account of the usual high cost of ground, something of a necessity. But outside of Washington the District is very far from being closely built up and ground in the settlements is not extremely high in value. The brickmaker is a loser by the use of the party-wall—it takes less bricks to build. And the man who lives in a party-wall house is often a loser—loses his temper, his sleep and sometimes his respect for the folks just on the other side of the wall.

If the party wall must exist, some genius should invent a cheap, noiseless wall, warranted not to allow the passage of the loudest piano plunks and wails from the most energetic and enduring keystormer and music murderer.

But when it comes to a matter of the ideal home, there is a man in London, England, that, according to my thinking, carries off the prize. His idea in this is to lay off small towns into lots to be occupied by houses (one to each lot), surrounded by flower gardens and grounds for raising vegetables. These towns are to have modern conveniences, and each home-owner will be at the same time a city man and a countryman. He will hoe garden sass, set hens, milk cows, chase hogs out of the potato patch and do other work in the daytime, and when Night drapes her sable curtain o'er the golden west and broods afar o'er hill and dale, store clothes will be put on and the street car boarded en route for the big meetin' or the club.

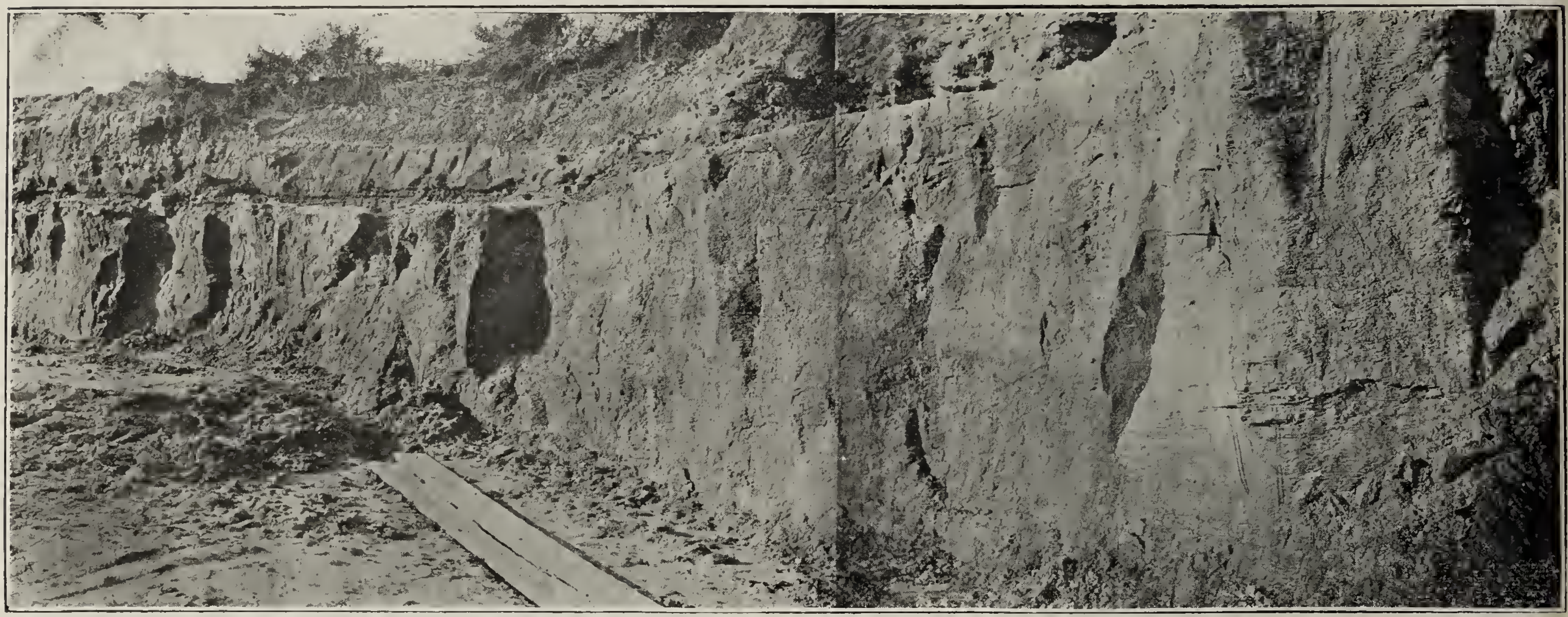
Now, such a place is where one might live to a green old age, among green things and away from the centers of mad, crowded haste and party-walls.

Perhaps it can be said that Washington will soon inaugurate a reform movement in the manner of apartment home life. But I am not so sure of the success of the movement. It is this: A large house has recently been purchased and is being fitted up for bachelors only. This may or may not be a step in the right direction, for all the particulars are not at hand. The house has thick, strong walls and floors, but it cannot yet be stated whether the key-holes will be illuminated. However, I do not say that any of the future occupants of this bachelors-only building will need illuminated aids in getting indoors, nor that they would ever mistake said luminous door fixings for fireflies and begin singing, in zero weather, "The Good Old Summertime." But these "single quarters" should, with undisturbed surroundings, be good for "Reveries of a Bachelor"—not revels of the same.

Carrying out the plans for the new sewer system for Washington has taken a great deal of the brickmakers' output, and will continue this help for some time. This system now consists of 457 miles of sewers, the cost of which is about $12,500,000. This is an immense sum of money, but the work for which it was spent is extensive, and some of the sewers in themselves were great undertakings. One of the largest sewers in the world is now nearing completion here. It is so huge that two teams of horses, side by side, could be driven through it. The inside diameter is 23 feet 6 inches, the outside 36 feet 6 inches, and the walls of the arch are more than ten feet thick. The upper half of the sewer makes a twelve-ring brick arch, the lower half is lined with vitrified brick, and the latter are laid above a concrete foundation.

This untraveled subway—save by the river of health's help—begun several years ago, is built after the plan of the great sewers of Paris. There are two space sections inside, upper and lower, the first making the chamber formed by the upper curve, the second a chamber 6 feet deep and 5 feet in width. This arrangement prevents clogging, allowing a continuous stream, at least in the lower waterway.

There has been in recent years great improvement in the manner of excavating for sewer work; less hand work is employed and much machinery, particularly in telpherage, carrying apparatus. This is seen in several parts of Washington—one near the Smithsonian grounds on B street, where another very large sewer is being built. Here the conveyors with their freight of dirt—often fine clay—dash up and down on trolley cables at remarkable speed, looking, at a distance, something like small flying machines.


Brick Clays of New Jersey—Panoramic View of Clay Pit Near Hackensack River. To the Left May be Seen Depth of Sand Above Clay.

Professor Langley might get an idea here in regard to flyers. His machine started to do a "stunt" in the ærial line, but, after demonstrating that it could fly—if it could keep up—fell down in the Potomac River—to show that it could float, anyhow. Now, if the machine had been attached to a trolley wire— Well, why not build flying machines out of bricks? Bricks fly sometimes, and with marked effect. Such machines would be absolutely safe and their "staying" quality would about equal others of the moveless variety. Most of us have read the story of the "Brick Moon"; the brick flying machine is just as possible.

A red-brick moon, with a green north pole,
  And a salt glaze on its face,
In a deep blue sky, should be the goal
  In a red-brick flyer race.

Speaking of the District of Columbia government again, I will say that its chief officials are thoroughly convinced of the fire-resisting quality of brick and will submit to Congress some amendments in building regulations concerning the use of this and other material, particularly in the matter of floors, piers and columns.

I do not know of a better test of the fireproof quality of brick than is found here in the Capital City, at the Navy Yard. Here is found the forge shop, with forty forges of brick, on which continually play streams of white (gas) fire. And there are brick furnaces where metal is brought to incandescent heat. This shop is an interesting place worth seeing. In almost every part of the big building (of brick) fires glow, anvils ring and sparks fly, while huge steam hammers bang away upon sparkling metal and a 25-ton electric crane rolls up and down overhead. One hundred and forty men toil here making gun and gun-carriage fittings such as are not bought by the government from private factories.

NICODEMUS.

Written for THE CLAY-WORKER.

BRICK CLAYS IN BERGEN COUNTY, N. J.

ONLY ONE SECTION in the state of New Jersey makes more brick or utilizes the wealth of suitable clay more extensively than Bergen county, and the bulk of the manufactories are located at Hackensack, Ridgefield Park and Little Ferry. There is a brick works at Carlstadt and another at Kingsland, both in Bergen county, but they are only individual firms, while at the former places there are ten firms engaged in the business. There are clay beds at Garfield on the Passaic river.

The manufacture of brick was begun at Hackensack more than 100 years ago, when two men began making a few bricks by hand, and from that small beginning has grown the present enormous business. Whether the increase of business at the yards near tidewater will continue it is impossible to say. Some incline to the belief that there will be a drift away from the tidewater because of the difficulty of keeping the pits clear when they reach below the sea level at low tide even, while at high tide the water in some places almost flows over the embankment. Pumps are necessary all the time, which add to the expense. It is interesting to note in this connection that the new yards are located at some distance from tidewater, and that their transportation is all by rail, with suitable sidings run directly into the yards in all instances, and into the sheds in one. It is said that this method of transportation is quite as cheap as by schooner, which was the principal reason for the location of some of the yards.

Conditions have changed materially in the vicinity near New York since the yards now in operation were founded. Formerly there was plenty of time for any sort of transportation. Now schooners are too slow many times. Rail is about the only transportation methods that are entirely satisfactory, and the fact that water transportation is closed for one-third the year is an important factor in determining the drift of the location of the new yards.

In the fifth volume of the Geological Survey of New Jersey, just published, the clays of the state are taken up in detail and their value for brickmaking and other purposes is demonstrated scientifically. There is much variation, though it is the belief of geologists that substantially all the clay beds in the state were laid down at about the same time and in practically the same way. In other words, if geologists are right in their conjectures, the sources of the clays over the entire state was the same. All were laid down in still water, but no one can say just where the material of which they are composed was commuted. It is interesting to note in this connection that there are outcroppings of clays elsewhere, notably in New York state, which are believed to be continuations of the same beds but they dive beneath mountains and pass under rivers between the different localities. The composition appears to be the same and the laminations are of uniform thickness, corresponding in all essential particulars to the New Jersey clays.

In discussing the Bergen county clays the State Geological Department gives test of a sample which will serve to indicate the salient characteristics of all the clay in that county. The variation is too slight to be considered.

Water required for mixing, 22 per cent; air shrinkage, 6 per cent; average tensile strength, 108 pounds per square inch. At cone 05 fire shrinkage, 4.3 per cent.; absorption, 7.88 per cent.; color, good red; bricklet, nearly steel hard. At cone 01, fire shrinkage, 7.3 per cent.; absorption, 28 per cent.; bricklet, red. At cone 1, bricklet practically vitrified; fire shrinkage, 6.8 per cent.; absorption, 1 per cent.; color, good red. At cone 3 the clay was beyond vitrification and it had begun to swell so that its fire shrinkage was only 7 per cent. In fact, it was unable to hold its shape at this point. In actual practice the clay is always mixed with a certain proportion of the overlying sand in order to reduce the fire shrinkage and make it stand up better in burning. The bricks at Hackensack and Little Ferry are all molded by the soft mud process and burned in scove kilns.

A Projecting Point of Clay Showing Delicate Laminations.

Here are two analyses of common brick clays which show the character of the clays very minutely:

	Hackensack.	Little Ferry.
Silica ($Si\,O^2$)	59.69	66.67
Alumina ($Al^2\,O^3$)	24.05	18.27
Iron Oxide ($Fe^2\,O^3$)		3.11
Titanic Oxide ($Ti\,O^2$)	0.44	0.85
Lime ($Ca\,O$)	1.63	1.18
Magnesia ($Mg\,O$)	2.03	1.09
Potash ($K^2\,O$)	0.54	2.92
Soda ($Na^2\,O$)	2.39	1.30
Water ($H^2\,O$)	4.85	4.03
Moisture	0.80	.....
Total	96.42	99.42
Total fluxes		9.60

The following analysis of the Garfield clays shows considerable variation from the Hackensack clay, indicating a red-burning clay, fusing at a low temperature:

Silica (SiO^2)	73.71
Alumina (Al^2O^3)	11.09
Ferric Oxide (Fe^2O^3)	4.30
Lime (CaO)	2.31
Magnesia (MgO)	1.71
Potash (K^2O)	1.87
Soda (Na^2O)	1.42
Combined Water (H^2O)	3.93
Total	100.34
Total fluxes	11.61

These analyses show the character of clays and indicate something of the character of the product. Inasmuch as the business is no experiment, but is the oldest industry in that section of the State, it can readily be understood that so far the product has been eminently satisfactory. Conditions for the past few seasons, with the exception of the one just closing, have not been favorable and manufacturing has not been profitable. The past year, however, conditions have changed and the season has been profitable. The prospects for a continuation of this prosperity are promising, and it is thought likely that all the brick now in process of manufacture can be sold at good prices.

This leads to a consideration of the possibility of further development of the industry by the construction of new yards. A gentleman somewhat familiar with the brickmaking industry in the vicinity of New York said, when asked the question, that he does not expect to see much further increase in the number of yards. He pointed out that in some instances, at least, the matter of securing clay is becoming more expensive than it was formerly. For instance, one large firm hauls the clay it uses nearly a quarter of a mile on carts. This necessarily adds to the expense. In addition, it mixes practically 25 per cent of sand with the clay in practicæ, which must also be hauled. Such firms as those, the gentleman thought, would not undertake further development. He pointed out, also, that the two firms which have recently begun business are located away from tidewater, where it is easier and therefore cheaper to secure clay and where transportation is wholly by rail.

A Clay Pit Near Hackensack River, Showing Depth Below Level of the River and Ocean. The river is seen in the background.

A good deal of discouragement is expressed by different individuals connected with the industry, though it must be admitted that they have been fewer since the period of enlarged demand and advancing prices began. With a good market and fair prices for the product, the Hackensack yards will increase their output, even though they do not expand the area of the yards which they are operating.

BURTON.

According to statistics produced by State Labor Commissioner M. D. Ratchford, of Ohio, a million and a half tons of fireclay were mined in that State in 1903.

Written for THE CLAY-WORKER.

TWENTY-SIXTH ANNUAL CONVENTION OF U. S. POTTER'S ASSOCIATION.

THE UNITED STATES Potters' Association brought to a close the twenty-sixth annual convention December 7th at 7 o'clock in Hotel Raleigh, Washington, D. C., with a banquet. Many distinguished members of the Forty-eighth Congress were present. An invitation was extended to President Theodore Roosevelt.

The banquet was up to the high standard of the enjoyable events so generally looked forward to by those who have attended in former years. No other American industry has succeeded in obtaining the presence of so many government officials at a trade dinner as have been at the potters' banquets in the past two years.

The banquet was a brilliant success and was attended by many distinguished gentlemen of the Fifty-eighth Congress. Many excellent toasts were offered.

The officers and committeemen elected at the afternoon session follow.

W. E. Wells, of East Liverpool, president; Daniel Willet, of Trenton, vice-president; J. Mayer, Beaver Falls, second vice-president; George S. Goodwin, East Liverpool, treasurer; H. A. Keffer, East Liverpool, secretary.

Executive Committee—W. M. Burgess, chairman, Trenton; J. N. Taylor, East Liverpool; Charles W. Franzheim, Wheeling; W. L. Smith, East Liverpool; John A. Campbell, Trenton; Daniel Willets, Trenton; N. A. Frederick, East Liverpool; George C. Thompson, East Liverpool.

Art and Design Committee—W. A. Rhodes, chairman, East Liverpool; Robert T. Hall, East Liverpool; Homer Taylor, East Liverpool; C. G. Gosser, Coshocton; F. R. Haines, Baltimore; Lewis Brown, Buffalo; John Hope, Trenton.

Membership Committee—John Cartwright, chairman, East Liverpool; W. W. Harker, East Liverpool; Charles Ashbaugh, East Liverpool; James E. Norris, Trenton.

Selling Price Committee—Charles Franzheim, chairman, Wheeling; A. M. Maddock, Trenton; Charles Howell Cook, Trenton; Charles I. Aaron, John N. Taylor, James T. Smith, East Liverpool.

Reception Committee—W. L. Smith, chairman, East Liverpool; Edwin M. Knowles, East Liverpool; Thomas Donoher, Trenton.

Kilns and Fuel Committee—James Pass, chairman, Syracuse; J. E. Jeffords, Philadelphia; J. T. Moore, Trenton; Charles Maddock, Trenton; H. N. Harker, J. W. Vodrey, East Liverpool; E. J. Owen, Minerva.

Historical Committee—Henry Brunt, Baltimore.

Transportation Committee—H. P. Knoblock, chairman, East Liverpool; John A. Campbell, Charles Howell Cook, Trenton; George C. Thompson, East Liverpool; Daniel Willet, Trenton.

Statistics Committee—Lewis A. Aaron, chairman, East Liverpool; J. R. Warner, East Liverpool; H. D. Winthinger, Steubenville; Thomas Carr, Wheeling; H. B. Moses, Trenton; George C. Murphy, Barberton.

Auditing Committee—W. L. Taylor, chairman, East Liverpool; James E. Norris, Trenton; Thomas A. McNicol, East Liverpool.

Machinery Committee—Joseph G. Lee, chairman, East Liverpool; Henry Brunt, Baltimore; O. C. Vodrey, John S. Goodwin, Pat McNicol, East Liverpool; Harry E. Thompson, Toronto; Will S. George, East Palestine.

The man that makes his own opportunities generally knows how to use them, while many a boy is spoiled by being given an opportunity for which he is not prepared, and many an opportunity is wasted in the same way, which means that it is proper to give opportunities to boys, but the boys should first be properly prepared to receive them.

Written for THE CLAY-WORKER.

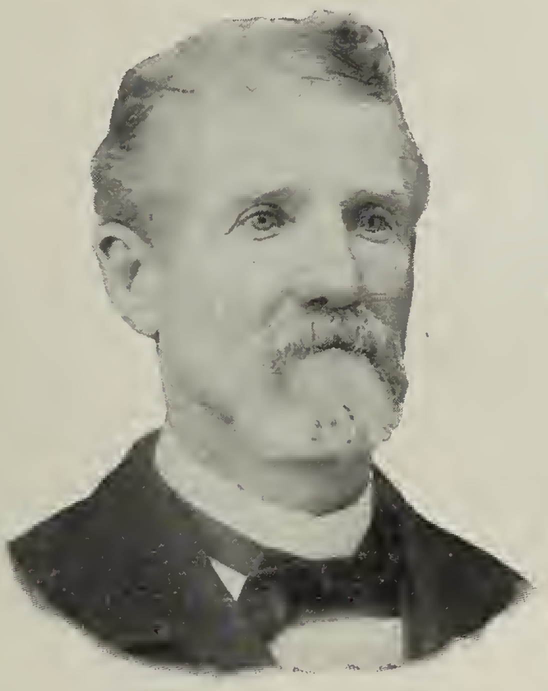
BRICKMAKING IN MORMONDOM.

Interesting Features in and About Utah's Capital City.

SALT LAKE CITY, UTAH, the great commercial center for all the territory lying between Denver and San Francisco, has a population of sixty thousand people.

When we consider that sixty years ago the region where the city now stands was a wilderness, a desert, we are amazed at the wonderful achievements of this struggling people under so many difficulties. Truly the Mormon people have made the "wilderness to blossom like the rose" They found only an arid land, surrounded by majestic mountains with their pure streams of water, a fine climate, an almost cloudless sky, and a typical River Jordan. Here they pitched their tents, and by their industry and perseverance they have built a city of magnificent homes, of fine business blocks, of substantial public edifices, of many churches, and public schools and charitable institutions. Here we find the St. Ann's Orphanage, a home erected by the wife of United States Senator Thomas Kearns, at an expense of $75,000, while the Senator donated the block on which it stands. The Utah State University and several other institutions of learning are located here. The Great Mormon Temple and the Tabernacle are buildings of more than ordinary interest. The Temple is sacred to the Mormon people, none excepting a Mormon ever entering its doors. The Tabernacle is a great turtle-shaped one-story building that will seat ten thousand people. The acoustics of the structure are so perfect that the dropping of a pin, or a whisper, may be distinctly heard from one end of the building to the other. All public meetings of importance are held in the Tabernacle, although there is a Mormon church in every ward in the city.

MISS M. E. CAHOON,
Sec. Salt Lake Pressed Brick Co.



WILLIAM S. SIMKINS,
Supt. Salt Lake Pressed Brick Co.

JOHN P. CAHOON,
Pres. Salt Lake Pressed Brick Co.

Uncle Sam is completing a magnificent Federal building on the principal business street.

Salt Lake is a beautiful city, with well-made streets, 132 feet wide, well shaded and with streams of water constantly murmuring along each side of every street, even in the business portions of the city.

There are many parks, lagoons, springs, mines, and other points of interest in and about the city. Eighteen miles distant and to the west is the Great Salt Lake, a body of water that is peculiar, when we consider it as a pleasure resort, as no boats are to be found on its placid bosom. The extreme saltiness of the water corrodes the machinery of the boat so that it soon becomes unworthy. So, with the exception of a single boat, Salt Lake is a smooth, clear body of water, undisturbed save for the many seagulls that constantly hover over it and whose homes are in the mountain islands seen in the distance. The Lake is popular as a bathing resort, and hundreds are found bathing in the briny waters every day during the warm months.

Salt Lake City is the home of many millionaires, and its chief source of income lies in the many mines that lie in the surrounding mountains. This is a city of stone and brick houses. While we see here and there the original adobe and the occasional frame house, one is impressed by the number of fine brick buildings, the cream-colored brick house being the most beautiful.

There are several large brickyards where both dry press and soft mud bricks are made. The Salt Lake Pressed Brick Company, south of the city, and the Improved Brick Company, north of the city, each have a daily output of 100,000 daily. The Hatch Brick Company, also north of the city, has a daily capacity of 50,000 or 60,000 daily. There are several smaller yards where the work is carried on only during the warm weather. There are two small firebrick plants in operation, and a new firebrick plant is almost nearing completion.

The Salt Lake Pressed Brick Company is one of the oldest and most successful plants in the West. Members of the N. B. M. A. will be particularly interested in it inasmuch as Mr. John P. Cahoon is identified with it. Indeed he is president of the company and has directed its affairs for some years past. Connected with him is Mr. William S. Simkins, to whom Mr. Cahoon says is due the credit for the success of the company, for he is a practical brickmaker, having spent most of his busy life as a brickmaker. He pioneered the dry-press process in the Far West, being one of the first to make brick by that process. He is a walking encyclopedia on all matters pertaining to making brick. If he could be induced to attend one of the National Conventions, the members of that organization would find him a well-spring of information. The company is fortunate in having among its office force Miss M. E. Cahoon, who has served as secretary long and faithfully. They make both dry press and stiff-mud brick at the rate of 100,000 a day. They and the neighboring plants as well have had a good year. Indeed the plant has been run night and day much of the time. The plant is equipped so that the dry presses—they have two four-mold Boyds—can be run either eight, sixteen or twenty-four hours a day, as occasion demands. The stiff-mud outfit is run only in the daytime. E. M. JONES.

Don't let good machinery that has been discarded rust out in the scrap pile. Put a card in THE CLAY-WORKER'S "For Sale" columns and find a purchaser.

Written for THE CLAY-WORKER.

AMONG THE CLAYWORKERS OF THE SOUTH.

KNOXVILLE, TENN., while in the heart of the hardwood lumber section, near both yellow and white pine timber and various other woods in abundance, also the center of the Tennessee marble district, is one of the best brick cities of the South, both in the manufacture and use of this historic clay product. In fact, it impresses one as being practically a brick town, as most of the old as well as the new buildings of importance are made of brick, notwithstanding the prevalence of other kinds of building material. The best hotel, the biggest office buildings, the finest apartment houses, as well as the great strings of business houses and better class of residences, are built of brick, so it goes without saying that there are some good brick manufacturing plants in that vicinity.

AN UP-TO-DATE KNOXVILLE BRICK CONCERN.

One of the most successful, as well as up-to-date and enterprising, brick concerns of Knoxville is the Knoxville Brick Co., which has offices in the Empire Building and works out at Powell Station, a few miles out from the city. This company was organized in 1888 and has done a successful and increasing business from the start, enlarging the business and the plant from year to year, till now they have a strictly modern plant with a capacity of 50,000 brick a day. The officers of the company are: D. A. Carpenter, president; A. F. Sanford, vice-president; E. L. Williams, secretary, and J. W. Reagan, superintendent. The plant is equipped with Chambers machinery for making common brick, Boyd press for red-front and special shapes, Dunlap screens, and a Marion steam shovel for digging clay. One time the company made some paving brick, but they gave that up some time ago and are now confining the work to common hard brick and red pressed square and ornamental brick, making about 40,000 common brick a day and 10,000 of the ornamental. Mr. Williams says they are now getting ready to add some more machinery, for which purpose they will shut down the first of the year and expect to be ready for operation again by the first of March. There is some chert in their clay that they want to reduce a little better than they have been in the past, and for this purpose they will add some Chambers crushing rolls. They will also make some improvements in their power plant, and likely add an automatic stoker. Mr. Williams is a faithful follower of modern methods, reads THE CLAY-WORKER to keep in touch with the new ideas and machines coming on from month to month, and never lets anything of interest pass without investigation into its possible merits in his business. Their steam shovel is an example of up-to-date ideas and Mr. Williams is proud of it, even though he does not get as good results from it as he would if he were making twice as many brick. In other words, he says the shovel would supply him with clay for 100,000 a day, while he only needs half that amount, so he is not getting the results in the way of cost-reducing that he would if the plant were larger. Still it pays and is also much more satisfactory than hand work, for the shovel is there on Monday morning and every other morning, and does not go on a strike for more wages, nor do other unexpected things.

General View of the Works of the Knoxville Brick Company at Powell Station.

THE MODERN IDEA IN STOKERS.

Another modern idea that they are wrestling with now is that of putting in an automatic stoker, not only to lighten the labor of keeping up steam, but to enable them to use cheaper fuel, which, it is figured, will be enough of an object in itself to make the automatic furnace feeder a paying investment. Take this plant all through, and hear the ideas of the men that operate it, and you have an example of the strictly modern ideas and progressiveness that characterize the South to-day, and it is an example that it does one good to bump up against.

Speaking of business, Mr. Williams said that trade was very good up to October, but dropped off considerably then, and while it has improved some since, it has not yet recovered enough to make up for the slow period. He thinks, however, that next season will be good, for all indications point to a prosperous and busy year. There will be an unusual amount of rebuilding in Knoxville, owing to the fact that the heart of the city was recently swept by a disastrous fire that gutted many of the main business buildings, but Mr. Williams says that will not call for as much in the way of new brick as one might think. There should be a reasonably good call for red front and ornamental brick in the reconstruction of these buildings, but there will not be a great quantity of common brick needed in the restoration, for even where the walls are not standing yet in the burnt district the brick are there in some shape, and the majority of them will be used again. Still, with Knoxville and the surrounding territory, they expect to do a good business next season, and are getting in shape to take care of the trade and also improve the quality of their brick by the addition of new pulverizing machinery.

THE DOINGS OF CHANDLER.

In walking about Knoxville, or talking about Knoxville, it is pleasant to know that the man who has the reputation of building not only most of the cement sidewalks there, but also of being the first man to make a really good cement sidewalk in the city was a brick man, Mr. Chandler, of Chandler & Co. Mr. Chandler was born in Pennsylvania, reared in Ohio, and has been in the brick, tiling, sewer pipe, roofing and builders' supply business in Knoxville about twelve years. He carries in stock at his yard a good supply of sewer pipe, tiling fire brick and everything that a modern brick and supply house should have, including lime, plaster and cement, and reports business moving along nicely. Speaking of the characteristics of the trade in Knoxville, he says the town has caught the hard-wall-plaster fever, and caught it bad. There are already two plants in the city manufacturing hard-wall plaster, while Mr. Chandler, who has been handling the product of the Kentucky Wall Plaster Co. and getting his share of the business right along, is threatening to start a factory of his own in Knoxville. He says the hard-wall plaster business is growing right along, and has room to grow more yet, but, of course, there is a chance to overdo any business, and that's what may be done to the plaster business in Knoxville.

Mr. Chandler has embodied some good ideas in his display of fire clay products in his office, having erected a number of fireplaces against the wall to the right as you enter, working into the scheme ornamental as well as fire brick, making both an attractive and suggestive showing. His yard is also kept in nice shape and tells at a glance what it is and what one may expect to find therein. The three most prominent articles making up the yard display are sewer pipe, drain and roofing tile. The whole place suggests that care and knowledge of the business that makes the prospective buyer feel that he has struck the right place as soon as he comes in sight, so it is no wonder that Mr. Chandler reports business moving along nicely, with a bright outlook ahead, for if there is business doing he is sure of his share.

The Green Brick as they Come From a Chambers Machine.

THE SOCIAL FEATURE PROMINENT.

One of the most pleasant features about these progressive Knoxville brick men is that while they are full of enterprise and business, they have the true Southern social spirit and not only want to take the visitor around and show him the sights, but hobnob one with another in that friendly way that we talk so much about in association meetings. They have not been so strong on association work as some of the trade in the North, partly because the association has not been meeting south of the Ohio River any, but they have the true association spirit, and it is a pretty sure thing that they will get in the band wagon with the other good fellows when that big meeting comes off at Birmingham. And there are other brickmakers in the South with the same spirit and in the same fix who will be made to feel good over the gathering of the clans in the South country; in fact, there are some more in Knoxville, but time was short and I could not stay over to see them, even though tempted by the promise of a ride around in Mr. Chandler's Oldsmobile.

IN THE "LAND OF THE SKY."

Asheville, N. C., that "Skyland" city of the South, resting at an altitude of approximately 2,000 feet, will probably be seen by many of the visitors to the meeting at Birmingham, as it is worth going some distance out of the way to see en route and can be reached by many without much additional cost. If you are nervous it may give you a little headache at first, but it is worth two headaches to take the trip, and then, after you are there a little while, this feeling will disappear and in its place will come a desire to stop a week or two and breathe the fine, health-giving air of the piney mountains of that district. Then it is only a couple of miles to Biltmore, and that is worth seeing, too; but what I started to talk about is the fact that there are more different kinds of clay industries centering in Asheville than in any city of its size in the country. There are not only a goodly number of brickyards in the vicinity, but it is from here that a branch road starts out that goes into the kaolin and talc district of North Carolina, and many of the prominent operators have their headquarters in Asheville.

A Marion Steam Shovel at Clay Bank of Knoxville Brick Co.

It is the home of F. R. Hewitt, prominent miner of mica and talc, and an authority on these minerals that I was sorry to miss connections with while there. He has works at Hewitt, 94 miles out of Asheville, right in the midst of the district where talc, kaolin, marble and a number of other interesting products are mined, a locality well worth visiting by clay men.

In the way of local brick industries at Asheville, N. C., there is located just across the river the plant of the Asheville Brick Works Co., of which Mr. Penniman, a hardware man of that city, is proprietor, which makes both common and fire brick. Mr. Penniman says they have had a very good local trade this summer and are now closed for the winter, but expect to enlarge their works considerably in the spring. They have both ordinary brick clay and fire clay in the same bank, one bedded on top of the other.

There has just been organized a new company, known as the French Broad Granite Brick Co., that proposes to erect works and make lime-sand brick from sand taken out of the French Broad River right in the city limits of Asheville. The company proposes to use the Huennekes system and feels very enthusiastic over the outlook in this business.

Down at Fletchers, a few miles out of Asheville, there is located two brick plants which properly have their home in Asheville, one of them having once been located in that city and the two of them making that their main home point, going to Fletchers simply because that offers better facilities in the clay line. The Asheville Brick and Tile Co. is one and the other is the works of Mr. D. S. Hildebrand. I enjoyed a short visit with Mr. Lewis Mattox in the Asheville office of the Asheville Brick and Tile Co., who said that they had recently added new machinery for making their paving brick so as to turn out better corners. I had noticed that Asheville afforded some mighty nice brick paving, as well as sidewalks, but was sorry to learn from Mr. Mattox that the city had recently concluded to try asphalt on some of its streets. Well, maybe it had to come, but there will also come a time when they will get tired of that and go back again to the good old brick. Business, Mr. Mattox said, was in very good shape and the outlook ahead as bright as one could desire. The city itself is enjoying a full share of prosperity and is adding good new brick buildings at a lively rate. In short, it is a good brick town, one of the best of its size in the country.

Mr. Otto Hildebrand, superintendent of the Hildebrand plant at Fletchers, said they had turned out about 200,000 brick this season and that business is good. They have some good contracts on hand, including a court house at Hendersonville, N. C., and feel good over the outlook ahead for next year. They make both common and repressed brick, the latter of a cream color.

Written for THE CLAY-WORKER.

FINIS THE FAIR.

Thoughts that Come with the Closing of the Great St. Louis Exposition.

HOW SHORT SEEM the months since that day full of sunshine, brightest day of the bright springtime, when the signal flashed from the hand of the President at the capital of the nation, the wheels turned, the fountains uprose, their globules of pure water sparkling like diamonds in the sun, the sweet chimes rang out from the German House and proclamation went out to all the world that the great Fair was open!

Standing there on the 1st of December, waiting for the closing hour of midnight, it seemed scarcely possible that seven months had flown. It ought really to have seemed longer than seven months, for, according to accepted theories, motion is the measure of time, and events, not blanks, are what we reckon by. The days had certainly been well charged with active, energetic life, but for all that it would not have been so difficult to imagine that this warm night of December was but the evening of the opening day. Yet withall there was something different in the air, a feeling that belonged to the last hour instead of the first, of regret and not anticipation. Crowds there were in strength enough. trying to keep up their spirits by making simple sounds with trumpets and rattles. The Pike had closed its shows early in the evening, for the Lord of Misrule gave evidence of being in command. It was not a vicious crowd, and was only good-humoredly defiant of high authority, waltzing around guards and taking friendly liberties with policemen, throwing "confetti" and playing all the grotesque antics that are consecrated to the carnival season. Up and down the Pike the crowd wandered, and each member of it, male and female, seemed to have the ambition to be a "spieler."

At 11:30 a fireworks show was to take place between Festival Hall and the Louisiana Purchase Monument—an insignificant display that was anything but a fitting ending for so glorious an effort as the World's Fair. Of course, the usual expanded description was not wanting, as, for instance, two pieces, "showers" stated to be each 300 feet long, actually measured 50 feet, but the crowd was not a critical one and there was no possibility of questioning the beauty of the electrical illumination.

Now the life of the beautiful creation could only be counted by minutes; another ten of these and midnight would be there. The musical chimes of the German House rang out once more, just as they did on the opening day, but though the tones were the same, the time, too, was the same, yet there seemed an air of melancholy about the music—the difference between "greeting" and "farewell."

Then came the end. The chimes ceased. The hour of midnight struck. President Francis threw over the electric switch that stopped the fountains and shut off the splendid illumination as he said: "Farewell, a long farewell, to all thy greatness."

WHAT THE EXPOSITION STOOD FOR.

What the Louisiana Purchase Exposition did for the world, what good it was except for those who made direct profit out of it, and what returns for their sacrifices the exhibitors will eventually receive, is more difficult to determine than it is at any time to answer the question of what are the actual returns from any other method of advertising. I am not here referring to the jurors' awards, upon which, having been a member of a jury myself, it would not be proper for me to comment. Looking at the matter from the serious business side, it is not certain that most exhibitors could not have invested their money to better purpose. If each one made out a debit and credit account, giving on one side the cost of preparing exhibits, the expense of installation, attendance, etc., on the other side the profits from sales, not many would show a balance to the good. The difference—in many instances a heavy one—would have to be charged to the advertising account. I know of one or two exhibitors who wish they had that money now for the purpose of using in the regular advertising channels.

One of the mistakes of the World's Fair management—for there were, inevitably many—was that there was too much of the bazaar and county fair element all over the place. There was rather too much "King of the Air," "Fireworks King," "King of the High Wire," and similar high-sounding titles, that the public became less impressed by as experience accumulated. Perhaps one of the most pathetic sights I have seen was the elderly Frenchman, Francois, with his devoted little wife, packing up his damaged airship after the Fair was over. He had perhaps invested his all in the brave attempt to capture the $100,000 prize. Disaster attended every one of the vain heralded flights. Poor Francois' airship was killed by a mean little projecting nail. The only thing that could be or was called a flight was one that Baldwin, the æronaut, made for a fixed sum of money. He was implored to do something to rescue the whole business from ridicule and wrote that he would do his best for $2,500 cash. A part of the sum was sent at once. Baldwin stitched a gas bag together, built a frame, fixed a kind of pin-wheel at the back and fitted in the first best gasoline motor he could find. The airship bore evidence of being hurriedly designed and made. The next thing was to find some one who could be sent up with the machine, for the æronaut's 200 pounds of adipose was too much for the gas bag to lift along with the other weight and the ballast, without which latter he would not dare to leave the earth. A young man was found who, though he had little or no ballooning experience, had plenty of "nerve" and the weight qualifications of a jockey. The one successful ascent was made on a day when there was absolutely no wind, and, by great good luck, the airship was able to come down again in the inclosure from which it rose. The only useful thing that the airship department has done is to prove that we are no more in sight of the probability of flying around to get orders for brick and tile or terra cotta than our forefathers were when Mongolfier made his first ascent. All aspiring mankind's efforts to control the high heavens, from the tower of Babel to the modern gas balloon, appear doomed to failure.

As to the bazaar element in the exposition palaces, there was too much of this. Things were not so bad at first, but as time went on the stands multiplied where rubbish was sold for high prices. The local papers told us of numbers of cases of the barbers around Union Depot who extorted outrageous sums from men who were unfortunate enough to become their customers, but some of the stallkeepers at the Fair by far outclassed the Union Depot barbers. I know of a case where a certain gold-filled article (it is not necessary to say what it was) was sold to a man for $25. I also know that the wholesale price of said article was 65 cents. I am not suggesting that the management of the Fair should be held responsible for this, but I do insist that these stalls and booths for sidewalk fakers' goods, with their noisy, insistent and vulgar touts, were not consistent with the dignity and scope of the great World's Fair and should not have been allowed outside the bounds of the Pike.

N.B.M.A.
LAST ELECTRIC ILLUMINATION
NIGHT
MISSOURI. Scene of N.B.M.A. Reception.
Wee Little HOLLAND
WHEELER
METALLURGY
MONUMENTS of STATES.
Here Will. P. dropped nickles & dimes
END OF PIKE
Where We Met for the

Clayworkers Who Visited the World's Fair Will Ever Bear Kindly Remembrance of Prof. Wheeler and the Scenes Here Pictured.

The lesson that the Fair has taught many exhibitors is not unlikely to be, not to take part in another Fair. In our own line there was not much to be learned. Probably the most instructive as well as interesting exhibit was the bricks from foreign countries. I don't know whether this exhibit should be credited to the N. B. M. A. or its organ, THE CLAY-WORKER—perhaps to both—but it was one that every brickmaker would care to see.

From what was seen and heard of the new competitor, the German sand-lime brick, the reasonable conclusion was that it will find its place under suitable conditions, but that it need not be looked upon with great alarm by the clay brick men. The sand-lime brick is probably a sufficiently good product for most building purposes. So far as is known it will stand fire and weather, though it is said to be unsuitable in underground work exposed to the action of water; but granting that it is a good building material, which I freely do, I still do not look upon it as a dangerous competitor, because I take no account of the vague notions as to the cost of production. There are plenty of men with a confused idea that you have only to go where sand costs nothing (there are plenty of sand deserts in the world), mix the sand with an insignificant percentage of lime (2½ to 5 per cent.), press the mixture into bricks, steam them for a few hours, then, hey, presto! some one pays you full prices per M and carts off your product to the building. No day-and-night burner, no fuel, no culls! Only enough coal is called for to run the machines and keep up steam in the hardening chamber.

Practice tells a different tale. It is found that more skill and care are required than for clay brick manufacture. The chemist is as necessary all the time as in Portland cement manufacture, while as for culls, a whole charge of bricks in the hardening chamber has before now turned out culls. If in the manufacture of sand-lime bricks unceasing care is exercised, just as has to be done with Portland cement, they will take and hold a worthy place among our building materials, but the cost of production will then be greater than is generally supposed.

What seems to me a far more serious competitor to the brickmaker is the cement block. In my wanderings through the Palace of Mines and Metallurgy, the Mining Gulch and the Liberal Arts, I noted several of these exhibits. The machines for producing the cement blocks are all very similar—indeed, one of the exhibitors, Harmon S. Palmer, of Washington, D. C., claims to have the master patents and is hammering the other fellows into line. Some of them have already come to terms and the others will probably soon submit; but whether the makers of these machines in different parts of the country work independently or pay a royalty to Palmer will have very little effect upon the question. The cement block machine is comparatively inexpensive—about $300, I believe. It is quite as portable as an ordinary hand press, and, so long as Portland cement is at anything like its present price (you can buy it in car lots at from 70 to 80 cents a barrel), brick cannot compete with the blocks. We cannot bring anything against the quality of the material, for we use Portland cement to bond our very best brick work. No special knowledge is required, for any ordinarily intelligent laborer can do the work from start to finish, and only the most inexcusable carelessness could produce culls.

'Ware the cement block! GEORGE J. M. ASHBY.

THE STOVE LINING MANUFACTURERS HOLD YEARLY MEETING.

Members Report a Good Year's Business.

THE ANNUAL CONVENTION of the National Stove Lining Manufacturers' Association was held at Broadway Central Hotel, Broadway, New York., Thursday, December 8th. In the absence of M. H. S. McLeod, president, the convention was called to order by the vice president, C. B. Flint, of Albany, N. Y. The minutes of the previous meeting were read and approved, and then the treasurer's report for the year was called for, and Mr. J. G. Williams showed an increased surplus over the previous years. When the question of increasing prices came up all decided to "stand pat" for the ensuing year. Mr. S. D. Horton said he could illustrate the situation in the trade by a story his fellow townsman, Chauncey M. Depew, told sometime ago. He (Chauncey) was passing along the main street in Peekskill one day when he saw preparations for a funeral being made by the undertaker of the town, so he stopped him and asked him who was dead. The reply was, "Mike Flynn." "What was the complaint?" "I don't know as there was any; all are satisfied." Such being the condition of the trade, we "stand pat."

A Part of the Old Plant at Mecca.

The following resolution was unanimously adopted:

"WHEREAS, This association having sustained by death the loss of R. W. Campbell, of the firm of R. Campbells Sons, Hamilton, Ont., since our last meeting, we desire to express our sincere sorrow and to extend our warmest sympathy to the bereaved family.

"*Resolved,* That these resolutions be spread upon our minutes and a copy thereof be sent to the family of the deceased."

The following officers were elected for the ensuing year:

Harvey S. McLeod, Troy, N. Y., president.
C. B. Flint, Albany, N. Y., vice president.
B. C. Pierce, Taunton, Mass., secretary.
J. G. Williams, Taunton, Mass., treasurer.

Owing to continued and pressing good business, many were absent this year, but the following firms were represented:

THOSE PRESENT.

McLeod & Henry Co., Troy, N. Y., by H. S. McLeod.

Newton & Co., Albany, N. Y., by C. B. Flint and A. W. Perkins.

Presbrey Stove Lining Co., Taunton, Mass., by B. C. Pierce.

Williams Stove Lining Co., Taunton, Mass., by J. G. Williams and Jos. S. Williams.

Reading Stove Lining Works, Reading, Pa., by Benjamin F. Fox.

Rogers & Co., Royersford, Pa., by W. L. Latshaw and H. C. Saylor.

Brooklyn Fire Brick Works, by E. C. Rice.

Peekskill Stove Lining Works, by S. D. Horton.

Union Stove Lining Works, Taunton, Mass, by G. W. Briggs.

Taunton Stove Lining Works, Taunton, Mass, by J. W. Parker.

Standard Stove Lining Works, Taunton, Mass., by Charles S. McCall.

Dighton Stove Lining Company, Dighton, Mass., by Charles A. Bloomfield.

BUSY TIMES AT MECCA.

The past season has been an exceptionally busy one at the extensive clay works of the William E. Dee Clay Manufacturing Company, at Mecca, Ind. They have built a large extension to their plant, and so increased their capacity materially. Their sewer pipe department, in which they make all sizes of pipe from 3-inch up to 24-inch, has been run full handed all through the season. The same is true of their flue-lining department. They are making a fine quality of chimney lining, ranging from 4x8 inches to 18x18 inches. They have built twelve new round down-draft kilns this season. The latter are each equipped with Tecktonius Kiln Band Lugs. They have used two sizes of these lugs, 4x⅜ inches and 7x⅜ inches, and are more than pleased with them. These lugs are manufactured by the E. C. Tecktonius Manufacturing Company, Racine, Wis., whose ad will be found on page 618 of this issue. The clay measures in the Mecca district are remarkable both for quantity and quality. The surface clay averages eight feet in depth; beneath this is a layer of coal a little more than one foot in depth. Then a vein of fireclay of nearly five feet, and beneath this an immense body of gray shale, which, where it has been bored, shows a depth of over two feet. Then appears another vein of coal a little deeper than the first, and beneath this more fireclay. It is no wonder that visiting clayworkers regard Mr. Dee and those associated with him with envy. With such an inexhaustible supply and variety of clays and cheap coal, Mecca has a great future as an industrial community.

A Part of the New Plant at Mecca.

The plants are in charge of Mr. Charles P. Walker, who is the right man in the right place, for he is thoroughly familiar with every detail of the work. In this, however, he is ably seconded by Mr. Dee himself, who spends two or three days of each week about the plants, and no detail of the work escapes his observation. The mechanical equipment of the plants is excellent, most of it coming from the factory of Taplin, Rice & Co., Akron, Ohio.

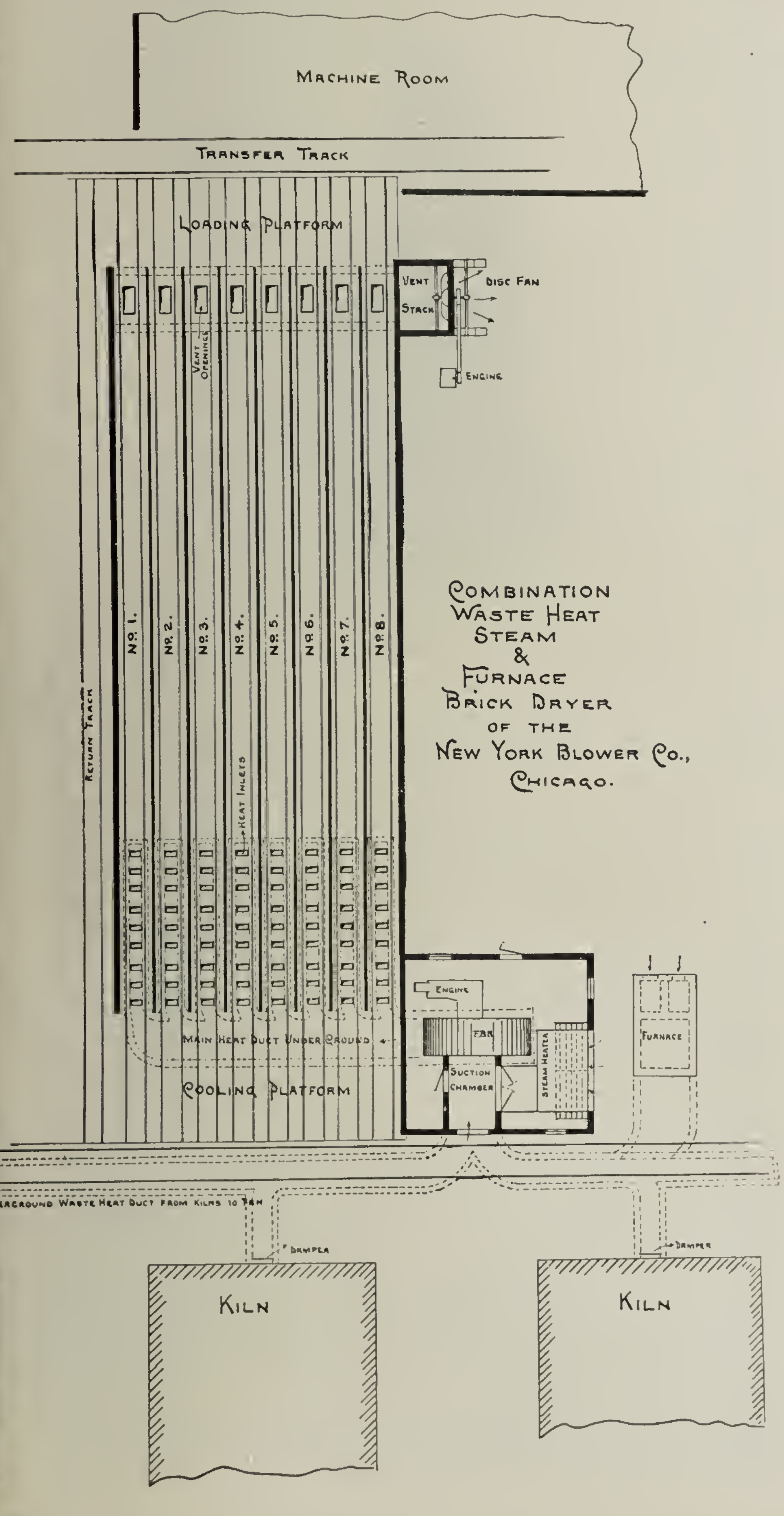
The chief product of the plant is sewer pipe, which constitutes about 60 per cent. of the output; about 30 per cent. is flue linings, and the balance fireproofing, drain tile, chimney tops, etc. Visiting clayworkers are always welcome, and they will find many things in and about the works of much interest.

The New York Blower Company's Waste Heat Dryer.

The accompanying cut shows a typical heat dryer of the New York Blower Co., with a steam heater and furnace added for an emergency, if not sufficient heat can be had from the kilns.

Very few of these furnaces and steam coils are erected now, as in a well regulated brickyard the waste heat from the kilns is sufficient for the dryers. The New York Blower Co. is erecting, however, a great number of the waste heat dryers during this time of the year. Some are erected in new plants, but in most places hot air dryers and steam dryers are changed over. The company sends its engineer to any place where demanded to look over the ground and see what can be done.

They have issued a new catalogue on waste heat dryers, which gives a pretty fair idea of the goods manufactured by them. This catalogue can be had on application by writing for their catalogue No. 54 to the office at 25th Place and Stewart avenue, Chicago.



Written for The Clay-Worker.

MILWAUKEE BRICK AND BUILDING NEWS.

ACTIVITY in all building lines in Milwaukee is very pronounced just now and has been for several months. The reports of the building inspector's office for the month of October showed a material gain over the same month a year ago, with 349 permits issued, aggregating $664,297, as against 289 permits and $586,108. There has been a considerable gain for the first ten months of the year, and with the permits already issued this month and those in sight for December, the year 1904 will be a record breaker for Milwaukee. The increases have been particularly noticeable since June. Up to November 1st, 3,122 permits had been issued, valued at $6,851,395, a gain over the same period a year ago of $600,000. Hundreds of small residences are going up and within the past three weeks permits have been issued for three large apartment houses aggregating $300,000. One of them, the Benjamin apartments, is on Prospect avenue, one of the stylish residence streets, and another, the Cudahy flats, on Grand avenue, another famous residence street. In addition to these residential structures there is great activity in the erection of new factory buildings and additions to old ones.

Contractors are just completing a lengthy stretch of brick pavement on Brady street, connecting with another stretch of the same kind of pavement laid last year on North Water street, making the longest continuous piece of brick pavement in the city. Not so much asphalt pavement has been laid in Milwaukee this year as in several previous years.

A large manufacturing plant just nearing completion is that of the Pawling & Harnischfeger Company, builders of electric cranes, just west of the city. A large amount of the brick for this big plant was supplied by the Burnham Brick and Supply Company. Another mammoth building nearly finished is the street railway central station and office building, which has been in the course of erection for the past two years. One of the latest contracts let for this building was that for enameled white brick for the interior, which also went to the Burnham company.

The Ricketson & Schwarz Company continues to "furnish the brick" for a large amount of the building in Milwaukee. George Schwarz has recently become a devotee of the automobile and drives a handsome touring car about the city, using it for business as well as pleasure. Mr. Schwarz became an agriculturist in a way this summer by serving very efficiently as a member of a Milwaukee Advisory Committee to the State Board of Agriculture for the State Fair held in September. The committee was created to suggest and carry out big amusement features for the fair, and Mr. Schwarz was in his proper element in that capacity.

The Berthelet Construction Company is one of the new companies in Milwaukee organized to manufacture and sell cement blocks for building purposes, and is turning out a very superior product. The plant adjoins that of the Milwaukee Cement Company, whose cement product is used for the mixture, and nearby are very valuable gravel deposits, which furnish the rest of the material. The company is making some very fine blocks with combination facing, utilizing crushed granite and marble to excellent advantage.

A contract has recently been let in Milwaukee for a new school house to be constructed of cement blocks. During the year the National Electric Company completed a handsome office building of the same material and the Schwab Furnace Company is now putting up a three-story office building of cement blocks.

"BADGER."

Acceptance of Sand-Lime Brick in Berlin.—Up to a few weeks ago, in every individual case where it was proposed to use sand-lime bricks in a building, the consent of the government department of works had to be obtained, and in each case a test of the bricks had to be made at the Technological Institute, which involved very serious delay. This rule still is in force for the country in general, but for the city of Berlin the Police President has issued an order admitting sand-lime bricks on the same conditions as ordinary bricks for use as a building material.—*Tonind. Z.*

Cleaning Cutting Wires.—In cutting the stream of clay in an auger press a quantity of small pieces of clay stick to the wires, which has to be removed, or else at the next cut larger pieces will stick to the wires, giving us a ragged or twisted cut. The cleaning of the wires is mostly done by hand, though a number of attempts have been made to do it mechanically. A recent effort in this direction has been made by John and Paul Seudzio, patented in Germany, No. 154973. As is known, the cutting wires of a brick machine are cleaned by an arrangement of two brushes at the end of the travel of the wires. This arrangement has proved defective, inasmuch as the brushes are fixed and the wires passing between them both ways pick up the clay particles again on their way back and do not make a clean cut. Besides this, the fixed brushes grip into each other and are difficult to clean with the usual jet of water. The new invention consists in the use of movable brushes, which come together for the purpose of cleaning the wire and separate when the wire returns to cut the bar of clay. During the time that the brushes are separated a jet of water effectually cleans them and removes any particles of clay—*Deutsch. T. & Z. Z.*

South America.—There are very few portions of the world in which Germany has so much hope for economic success as South America. In spite of the cry, "America for the Americans," South America, a division of the earth belonging to the Latin races, will remain for a very long time industrially and politically independent of the Union, although the latter has forced its sphere of action very close up to the boundary. The splendid development of the German lines of ocean transport to South America has put the shipping lines of the United States out of competition, so that there is every reason to hope that German export business will rejoice in a series of golden years. It is noteworthy that in the export of ceramics our South American trade takes a most gratifying place. It is, of course, the best with those states that are the most settled, both financially and politically, such as the Argentine and Chile, but Brazil and recently even that very much disturbed country, Venezuela, show possibilities of being good markets in the near future. The trade with Argentina and Chile in majolica, earthenware and porcelain is at the present time excellent, and some of our factories have received such heavy orders from those countries that the works will be kept running full time for twelve months to fill them. South America is and will be for a long time to come our own particular market, but we must not forget that here, as everywhere, we must be on the watch all the time.—*Keram. Runds.*

Cement Drain Pipes.—The great progress that has been made during the past ten years in the manufacture of cement pipes is in direct relationship with the development of the Portland cement industry. When we remember how serious were the misgivings, less than two decades ago, at the proposed use of cement pipes, and see their extensive use to-day, we must feel impressed by the triumphant success of this new industry. One of the difficulties in the way of introducing the cement pipes lay in the fact that the use of concrete had been forgotten for centuries; the other was that it is hard to get out of a rut, but the newer generation of technists were more free from prejudice and were readier to accept novelties, not only in building materials but in the machines for their production. The rapid acceptance of a good idea is desirable, though too much hurry invariably entails failures and disappointment. When people began to recognize the excellencies of cement pipes and their advantages, all kinds of compositions and mixtures were tried, as well as methods, for making and shapes for the pipes. The result was a number of costly failures. The ease with which the material can be worked has enabled shapes of all kinds to be produced, and sizes of pipes up to seven feet in diameter are made. These large pipes are reinforced with iron rods in the concrete, or what is known as armored concrete.—*Tonind. Z.*

Hardening Chamber for Sand-Lime Brick.—A question was asked in a previous issue whether it was more advantageous, in a sand-lime brick works with a capacity of 3,000,000 per annum, to have one large hardening chamber or two small ones, and a reply was received to the effect that two small hardeners would be better than one large one. Since then other replies have been sent in as follows: No. 1. Assuming that with the yearly capacity of 3,000,000 bricks the daily output is 10,000, then it would be a good plan to have two hardening chests, each to hold 10,000 bricks, so that the day's work could all be put into one of the chests and hardened the following day, while the second hardener was being filled. This is exactly what I do, and I find that the two hardeners are a great advantage, for we do not have to do the hardening during the night, neither do we have to store the bricks until they can be put into the hardener. No matter how much care is exercised, the bricks in their unhardened state are very likely to be damaged by moving the cars about much. The bricks also suffer by the action of the air. With two hardening chambers, the size of each is fifty four feet long and six feet in diameter. No. 3. For a yearly production of 3,000,000 bricks it is advisable to have two small hardening chambers, rather than one large one, and to order the work so that in the ten or twelve hours' labor enough bricks are pressed to fill both hardeners. With two chambers you have the advantage that the steam from one can be turned into the other and vice versa. In this way you can increase the capacity of your presses by 50 per cent. by working overtime, without having to have a third hardener. For one of these small chambers holding, say 6,500 bricks, can always be used twice in the twenty-four hours. On the other hand, you are able to reduce the daily output by half, that is to say by the capacity of one of the hardeners, but when using only one large hardener you cannot do satisfactory work unless you run it full. You cannot charge this twice in the twenty-four hours. No. 4. I cannot agree with the answer given in a previous issue. The drying of the pressed bricks while in the hardener is not considerable, at least, I have not had any trouble from this. Should the contrary have been experienced elsewhere, it is very easy to have a screen covered with muslin fitted in the hardener and move this each time a car is run in. By hardening during the night we have the advantage that there is no variation in the steam pressure, as there is in the daytime while running the machines. No. 6. The use of a single hardener is not in any case economical, for the utilization of the heat is very incomplete, but to set up two small hardeners of a capacity of 5,000 each will not be sufficient because the switching over of the steam from the hardener that has been under pressure to the one that is freshly filled can only be done once. It is not possible a second time, for the chamber that has been filled in the afternoon for hardening during the night. As, however, this switching of the steam from the finished charge to the green charge gives us a saving of fuel of at least 30 kilograms of coal per 1,000 bricks, it is a matter that should not be neglected. I would recommend you to put in two large hardeners, each to hold the full daily output of 10,000 bricks, and to adopt the following course: The hardener that is standing under pressure has its steam turned into the hardener that has been freshly filled. The pressure then slowly equalizes in the two hardeners to about two or two and a half atmospheres. The hardeners remain thus all night, and in the morning, with a moderately good insulation of the steam chambers, there will still be a pressure of from three-quarters to one and a half atmospheres. It is then an easy matter for the engineer, in addition to the steam required for the factory, to bring the pressure up to eight atmospheres and keep it at that the whole day. By working in this way I do the work with a fuel consumption of 105 kilometers per 1,000 bricks (German size). I may say also that by having two large hardeners instead of two small ones there is quite a considerable saving in wages, setting, etc. The opening and closing takes two men at least half an hour. I have not noticed any harm to the green bricks from standing in the ary, that is to say, at the rear hardener. As the lengthening of a hardening chamber is not very expensive (the most costly part of it is the door), you will find two hardeners each with a capacity of 18,000 the best for your purpose. At the same time I would urgently recommend you to have the grate surface of your furnace for the steam boilers large enough in order to get full value from your fuel. Many mistakes are perpetrated in this direction.

AN IMPROVED HIGH SPEED ENGINE.

THE ILLUSTRATIONS presented herewith show a small vertical engine recently placed upon the market which possesses unique features of great merit, making it the best engine of its class yet produced. From Fig. 1 it will be seen that the engine has easy curves and graceful lines, giving it a handsome appearance. It is fully enclosed, preventing foreign matter getting into the working parts, yet the latter are easily accessible upon the removal of the enclosing plates by simply turning a milled hand-nut and lifting out.

The most remarkable feature of the engine is its oiling system. Automatic lubrication of engines has been one of the details very slow in development. Up to the present time it has been confined almost entirely to the splash system, which is seldom thoroughly effective, and for vertical double-reciprocating engines is positively unreliable.

New American Blower Company Vertical Engine.

Such attention as this detail has received has been given to large horizontal engines, which are less likely to prove annoying through defective lubrication than are the small high-speed vertical engines.

The system embodied in this engine is something entirely different from any of the usual methods, and has proven successful far beyond the most sanguine expectations of its designers. Every frictional surface is running on oil, there being no positive contact between metals, with the effect of almost eliminating wear.

The oiling is done by the engine itself, and instead of a drop or two a minute, each bearing has a stream of oil. By referring to Fig. 2 the operation can be easily traced. An eccentric, "K," on the shaft actuates the plunger, "L," of the oil pump, "A," forcing the oil up through the tube, "B," into the small strainer, "C." From "C" it drops into an oil box, through the bottom of which four tubes project. In one side of each of these tubes there is a slot, so that when the oil box contains only a small amount of oil each tube can take its proper proportion. In case the box is full all the tubes get more oil in proportion to the increased height.

Two of these tubes, "F" and "G," and two on the opposite side, not lettered, apply oil to the guides, the oil dropping into a small oil trough, "G," from which it runs into the bearing through a small oil hole. The crosshead pin is supplied by the tube marked "E." The oil drops into the cup, "H," and fills the cavity between the pin and inside of crosshead pin and the oil grooves. The oil dropping from the crosshead is caught in two pans attached to the inside of the covers. From these oil pans it runs down the inside of the cover, dropping into a cup on the top of the main bearing cap. Instead of oil grooves at the top and bottom of the main bearing, as ordinarily made, in this pattern the bearing is cut away at the joint. When the strain from the connecting rod is up, the oil is carried to the bottom of the bearing, but when the load is reversed there are no oil grooves to carry away the oil. The crank pin is oiled through the tube marked "D." This tube discharges into a crank oil ring inside the eccentric "K," which in turn discharges into the crank pin oil hole and flows across the crank pin bearing. The crank pin oil ring, in addition to its independent supply, catches the drip from one end of the main bearing. The eccentric is oiled by the drip which it catches from the other end. Not the least difficulty has been experienced in catching the oil thrown off the eccentric strap, and the splash from the crosshead has been equally easy to take care of, the outside of the engine being absolutely free from oil. A portion of the oil as it drops back into the bottom of the frame drops upon an oil filter, thoroughly cleaned and purified. The large base gives the oil an excellent opportunity to cool and settle.

In their own shop the manufacturers have been experimenting with this engine for some two years past, and in connection with their experiments relate an experience which is little short of marvelous. An engine was adjusted and filled with oil on March 29; up to July 26 no adjustments of any character had been made and no oil added except to fill the sight-feed cylinder lubricator. It has been operating from fourteen to sixteen hours per day driving a blower, and after the lapse of over four months really needed no adjustment or fresh lubrication, running almost as noiselessly as at the first.

Sectional View of A. B. C. Engine, Showing Automatic Oiling Device.

While this is a performance which we have never known to be equaled by any other double-reciprocating engine, the builders claim that they expect every engine turned out to operate in an equally satisfactory manner. It will, therefore, readily be seen that this engine is particularly valuable for applications where continuous operation is required or peculiarly heavy duty imposed upon the engine, as in driving blowers, dynamos, pumps, etc.

Further information can be obtained from the designers and builders, American Blower Co., Detroit.

Written for The Clay-Worker.

THE MODERN CLAYWORKER.

TROUBLES.

THE OLD SAYING, "Tell your troubles to the policeman," is a good one, but after all, those in trouble like to feel that they are not alone. People who are fairly well acquainted with a number of clayworkers often hear the confidences that are said to best be confided to the police. There seems to be trouble in the path of everyone, probably because they look for it more or less. It seems, at times, that the clayworker's path is well strewn with trouble rocks. One comes to a good many "forks" and the selections of paths are varied.

I was sitting in the spacious rotunda of the Great Northern Hotel in Chicago recently, thinking about some plans of a clay working establishment, when a brickmaker acquaintance of some considerable experience dropped in a chair at my side and we were soon doing what one would naturally expect of two cranks —"talking shop." To use a common name for my friend, Mr. Brown drifted gradually into his troubles. He had been on a pilgrimage down through Ohio and had a composite picture of a plant in his mind that rather shaded his plant and naturally made it look like the proverbial thirty cents. I don't know just exactly what he wanted to find out or learn down in that locality, but he had been hand in hand with troubles, and probably like many another, was ripe to apply dozens of remedies that he had seen working out the troubles of others to his own difficulties. He said:

"I am at times almost decided to give up this clayworking business, but it seems too blamed attractive to throw off like an old coat. Let me see, this is my fifteenth year in the business. I have never quite realized my rosy dreams of the times previous to that eventful day when the whistle first sounded at my factory for work. You know how that goes, though; a person seldom sees the practical working of a plant as it is shown in theory. Sample brick always look better than the real everyday thing. You know I started out in dry-press, and that has paper points that are surely fetchers. Gold mining is second on the list, sure. When I bought my land I didn't realize that I had so much unhidden wealth. It cropped out in such a variety of colors and of such unlimited dimensions that it didn't take the prospector long to convince me that I could do them all on fine face brick. I have some very fine samples of what these different strata of shales and clays are capable of. I haven't added very many duplicates to my collection. Well, in the regular money-making run, being a gold standard man, I naturally selected the gold-colored brick as the main ammunition with which to force an entrance into the fort of trade. When the first kiln was burned off, for a few days it was more attractive by far than any "grab-bag" exercise that I ever attended in my boyhood days. No gold ever glittered more attractively than the anticipation of that kiln of brick. Well, it came out evenually, but some of the men lost their whiskers in getting the first ones out. Oh, yes, there was color there, nearly every color. There was no single gold standard about it. What gold color there was was sort of mixed with red and brown on the ends and sides, flashed, you know, and there was an elongated circle of beautifully blended rosy tint on the face. It cost me some considerable money and time to find that the way to clear that was to go slow after the first watersmoke was off and until trials taken from the top of the kiln showed that the black core in the drying brick had passed off. These brick with the beautiful center were merely individual beauties, and when taken in bunches simply called loudly of mistake, and I found that mistakes, however beautiful, didn't sell well. It was my regular nightmare to dream of going to inspect a job where my brick were used, and on arrival seeing in the wall all kinds of measly spotted brick. It wasn't long, though, before my worries took another turn, and I dreamed of chasing some poor little cuss, with an order for two or three thousand face brick up his sleeve, half way around the continent, and then have him tell me he "wasn't sure my brick would stand the weather," but if I would sell him at a certain price (below cost), he would take them, and thus do me thousands of dollars' worth of practically free advertising. That makes me think now how valuable such advertising is. I have often stood admiring my brick as they were being put in the wall and heard bystanders remark about them. Yes, they knew where they came from; they were Milwaukee brick. It's funny, isn't it, how little people who are not in the business think about brick.

"It will probably take a thousand years or more for the general public to understand that all "yellow" brick don't come from Milwaukee. There are other things besides beer that have helped make Milwaukee famous. Never been in the press brick or face brick business? Well, it is a sure-enough picnic. You can write more letters, do more traveling, find more necessary advertising mediums and do more strong hustling in order to scatter a few thousand brick over several hundred thousand miles of territory than in any business I know of. Full of troubles? Well, I should say so, and it is so disappointing at times. I spent a month once working with a committee for a facing brick job. My samples were very learnedly inspected and commented upon, but some way every expert that picked the brick up insisted on looking at the back of the brick, and they eventually bought the other fellow's brick, who was sharp enough to submit two-faced samples. I think that pays. It don't make any difference if buyers do allow contractors to put half the brick back to the street, without knowing the difference, they are keen-edged alright when it comes to sizing up samples. Then, there is the supervising architect. If you have in your face brick plant organized perfection and duplicates in all expert work, it is not hard to get along with them. Here is where the good sample and poor order filler gets it rather hard. The architect wants the job to look like one big sample, with perfect mortar joints, of course. He is not to be blamed, of course. He is out for his client, and if you can give him perfection at a shade higher price than you can get for any old thing in the common brick line, you are all right. This face brick business would be all right if we could go back to the prices of the times when Philadelphia red pressed brick were shipped into this country at about sixty dollars per thousand. Why don't I go into the common brick business?

"That's so, you haven't been out to see me lately. You see, I wanted to eliminate some of my troubles, so I put in a stiff mud plant. My main object was to overcome excessive burning cost. You know about robbing Peter to pay Paul. Well it's a little on that order when you save on the burning proposition and put it into drying. It wouldn't be just the thing for me to say the two should strike an even balance. In my case, though, I found that where I had lost money in making common pressed brick, I lost a little more in making stiff mud. No, I have no trouble in drying and I use my exhaust steam for drying in the day time, but the trouble with the thing is it works nights and the fireman either keeps a string of teams drawing coal away from my engine house or does too much work. I have an overpowering amount of exhaust steam. For a time I was pleased with the change, but after I had adopted an exhaustive cost system, which covered every conceivable move and expense, I found that I had other things to do in order to approach perfection. My conclusions were that if there was money in the common brick business, a man had to go after it in one way or in another; either with a small investment and a good local demand or an extensive and modern equipment, employing waste heat dryers or continuous kilns, and with both a large local and shipping demand present.

"What's that? Do I think that possibly some of my troubles have not been due to poor factory management? I think that is the whole thing, or has been. I think I have my plant so well systematized now that poor factory management is apt to prove injurious to salaries. I have been bothered a good deal in the past getting a regular output up to the real capacity of the plant, but word has gone out that the foreman who don't make additional improvements necessary will have to look up a new job.

Yes, I know what my plant is capable of. I find that "improvement" tendencies are the most difficult to overcome. Hardly a day passes but what I feel tempted to add from one hundred to a thousand dollars for some improvement. I find one is apt to decide rather hurriedly on the necessity for improvements. Too free a rein on improvements is apt to result in complicated confusion. I find that simplicity is the most effective thing about a clayworking plant. In some instances an improvement, which on the face of it seems the thing to do, often results in no improvement, simply because something else is in the way of the proper working of this improvement, and in order to get the result sought after it becomes necessary to carry out a full line of changes. I have noticed that some of the plants of which I have heard the most are the least spectacular, and that a good deal of the money and brains expended in the installation are not in sight. Evidences of poor brain power are by far the most insistent in gaining attention. Solidity and system in construction result in smoothness and quietness of operation. Bustle and rush may be evidences of enterprising push, but harmony of action is shown best where excited "get there" spirit is not everywhere in evidence, and where the output is regular with apparently no superhuman effort. Yes, the ordinary modern brickyard is full of troubles. I would like to start all over again. My new plant, when I build it, will be all planned and on paper, figured out and based on the solid rock of system, before a move toward construction is made. Well, I will bid you good-night. Keep your eyes open for a man who would like to buy a modern brickyard and send him to me, and you will have a nice fresh bouquet of thanks."

Engineering Hall.

Agricultural Group.

Burill Avenue Bridge.

Burrill Avenue's Fine Brick Pavement.

GROUNDS AND BUILDINGS OF THE UNIVERSITY OF ILLINOIS, CHAMPAIGN.

Written for THE CLAY-WORKER.

CHAMPAIGN'S ATTRACTIONS.

By Meeting There the Illinois Clayworkers Will Have an Opportunity of Visiting Their State University and Inspecting the Features of Special Interest to Them.

THE NEXT CONVENTION of the Illinois Clayworkers' Association will be held at Champaign January 10-11, 1905. President Butterworth, of Danville, and J. W. Stipes, of Champaign, have been very active for some time past in making arrangements for the approaching meeting. The papers already promised insure some very interesting discussions, plans have been made for the proper entertainment of the visitors and the outlook for a large attendance is very bright. Everything, in fact, points to a successful and profitable convention. The business sessions are to be held in the Elks' auditorium. The plans of the entertainment committee provide for a banquet to the visitors and to the leading business men for the evening of the 10th. Some time on the 11th a visit will be made to the University of Illinois. Through the courtesy of the local street car management those attending the convention will be accorded free transportation on all lines. The headquarters of the association will be at the Beardsley Hotel, which immediately adjoins the convention hall.

Champaign is nearly always associated with Urbana. These two towns were originally several miles apart, but such has been their growth that a stranger would not realize that they are two distinct towns unless he had been informed of the fact. Urbana is much the older. Champaign was established by the Illinois Central Railroad because satisfactory arrangements could not be made for the purchase of the right of way through Urbana. Both towns have experienced a steady, healthy growth, and now the combined population is about 20,000. Some idea of the growth at the present time may be had from the fact that the building contractors are rushed the year round. The surrounding country is a rich agricultural district, and the prosperity of the Twin Cities, as they are sometimes called, is due in a large measure to this fact.

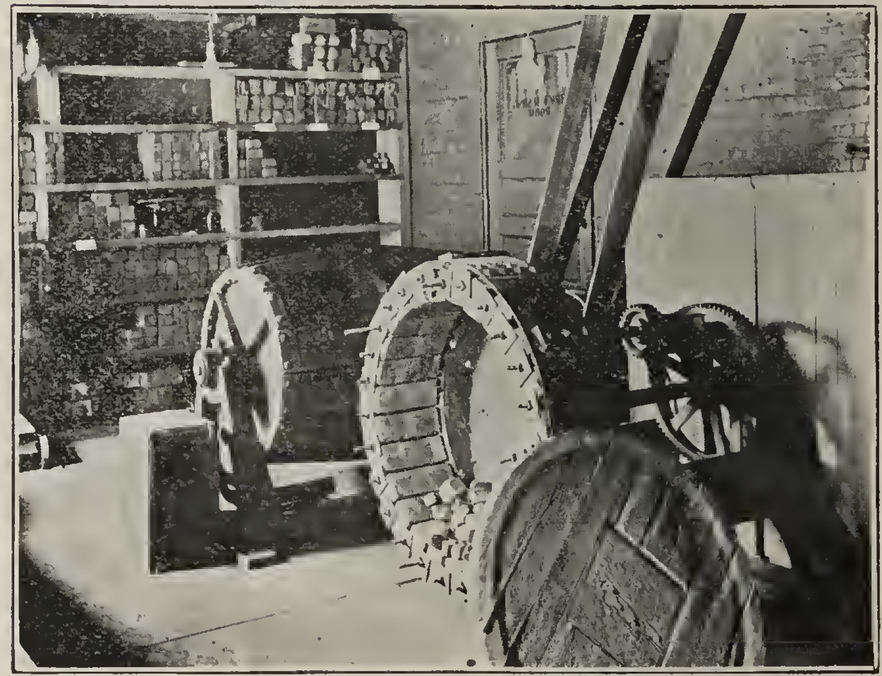
Elks' Auditorium, Where the Convention Will Meet.

University Library.

Champaign is now the larger of the two towns and by the last census had a population of 11,500. The city administration is very efficient, and the municipal improvements are a matter of pride to the citizens. For this satisfactory condition much credit is due the city engineer, Mr. O. L. Gearhardt. All of the more important streets are paved with brick, the total length being 16½ miles, of which most is vitrified paving block on a concrete foundation, and the remainder is two-course construction. More streets are being paved each year.

The town has a good sewerage system, of which perhaps the most interesting feature is the septic tank used for the purification of the sewage. This was built in 1897 and was one of the first to be constructed in this country. Roughly speaking, it consists of two large chambers, through which the sewage is caused to flow at a very low velocity. Meanwhile a bacterial action goes on by which the sewage is so purified that it may be discharged into a small stream without offense to the landowners below. The growth of the population will make necessary an addition to the tank before many years, but so far the efficient disposal by this method has been a surprise to the many municipal committees who have visited it to learn of its adaptability to the conditions in their home towns.

Main University Hall.



Brick Testing Room.

The present city hall is a two-story brick building in the business portion, but the advisability of erecting a larger structure is under discussion. A new postoffice has just been erected by the government.

Urbana, although smaller, has been very progressive in its municipal affairs. It has ten miles of good brick pavements and 40 miles of brick sidewalk. Since 1894, 16 miles of sewers have been constructed, and next spring a new septic tank will be put into operation to replace an older one, which is now too small to accomplish its purpose. Urbana is the county seat of Champaign county. The court house, a three-story brick building, was remodeled several years ago and now makes a very handsome appearance. A new jail is being built at the present time. Both towns are well lighted, and are supplied with water from deep driven wells.

There are no large manufacturing interests in either town. Urbana is a division point on the Big Four Railroad, and the shops located there furnish employment for a large number of men. Champaign is a division point on the Illinois Central and is a busy freight center. The Wabash has a branch to the two towns from the main line. The Illinois Traction Co. makes connections with Danville and other towns east of here by interurban.

Just north of Urbana are two brickyards, both soft-mud plants, owned by local men—the Sheldon Brick Co. and the Barr Brick and Tile Co. The Sheldon Brick Co., the larger of the two, is owned and operated by Mr. J. W. Stipes, who is doing so much to insure a successful convention. He began work with this company as a boy of twelve; upon the death of his employer he acquired the business and later enlarged his holding by purchasing the yard of a competitor near by. His success is due in a large measure to his perseverance and to his fair, straightforward methods of doing business. His yard produces paving, building and sidewalk brick. Besides the manufacture of brick he is interested in the sale of cement, sand, gravel, tile, fire-clay and fire brick and in the laying of brick pavement. Mr. Stipes has been the contractor for nearly all the pavements in the two towns, and their fine condition after years of wear speak well for him.

The plant consists of two yards, known as the east and the west yards, with six Wingard kilns of 600,000 bricks capacity each. The clay used is light-colored, which burns red. It lies near the surface and is from three to four feet thick. The equipment of the east yard consists of a Potts disintegrator and a Potts soft mud machine; that of the west yard of a Potts disintegrator and a Monarch brick machine. The drying is done under roofed racks having a capacity of 600,000. Fifteen tons of coke and twenty cords of wood are used for each kiln in water-smoking, and 130 tons of soft coal are required for the burning. Drying requires from four to six days, water-smoking six, burning six, and cooling down seven. During the past year the output was about 10,000, nearly all of which was disposed of in the two towns.

The Barr yard adjoins the Stipes plant and uses clay from the same source. This company was started some years ago as a tile factory, but the present owner, Mr. A. Barr, discontinued the manufacture of tile three years ago and is now confining his efforts to the manufacture of brick. The clay is hauled in wagons to the crusher and pug mill. A Standard brick machine, manufactured by the Ward Manufacturing Company, is used; 15,000 brick per day can be made on this machine. The methods of drying and burning are similar to those in use at the Stipes Plant. The kilns, three in number, are of the Wingard type and have a capacity of 300,000 each. The output during the past year was 2,000,000, all of which was used in the two towns.

General View of Stipes East Yard.

General View of Stipes West Yard.

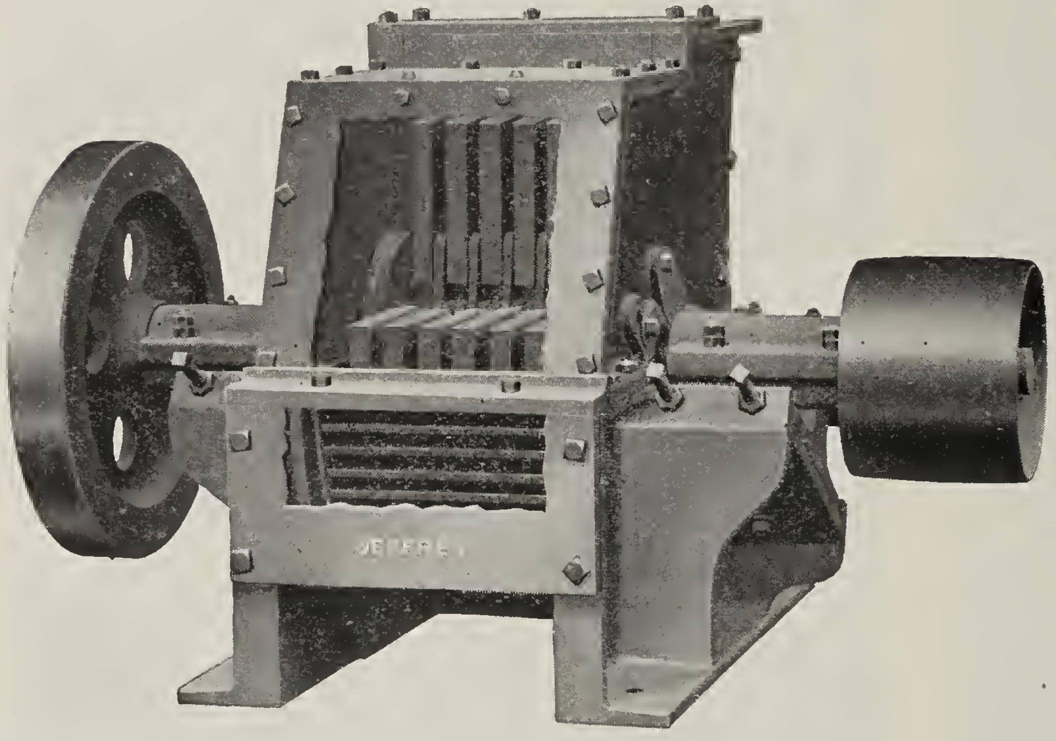
Drying Racks Stipes West Yard.

Stipes East Yard and Office.

An institution of common pride to the citizens of the two towns is the University of Illinois. This is located in Urbana, just on the city limits of Champaign. It was founded by the State in 1867 as an industrial college under the national land-grant act. Its early history was one of a struggle for existence, but since 1890 its growth has been remarkable. The attendance, including the medical department at Chicago, now exceeds 4,000. The campus proper covers 200 acres, and the university farm, which lies a mile south, is a tract of 400 acres. At present there are twenty-five large, substantial buildings on the campus, and five more are in the process of construction. With the exception of the library, a stone structure, and a few frame warehouses, all the buildings are of brick. The university has its own water works and lighting plant, and all the buildings are heated from a central station.

The purpose of the State in the support of such an institution is the promotion of its welfare through the training of its young citizens. Of late years there has been a special effort to help the commercial interests of the State more directly through the publication of information obtained from the studies carried on here. The college of agriculture has already done much for the farmers of the State, not only by instruction at farmers' institutes, but by the publication of bulletins announcing the results of experiments. The magnitude of this work and the appreciation felt for it may be inferred from the fact that for the past two years the State has made annual appropriations of $85,000 and the government of $15,000 for this purpose alone. By a manner somewhat similar the departments of geology and of chemistry are hoping to do a like work for clayworkers, mine operators, etc. Just a year ago the board of trustees established an engineering experiment station to do a similar work along engineering lines. The first bulletin—"Tests of Reinforced Concrete Beams," by Prof. A. N. Talbot—was issued during the past summer, and the warm reception and hearty endorsements given it by competent engineers indicate the value of such work.

Two features of especial interest to clayworkers should be mentioned. The architectural department has a large museum, in which is a large collection of fine building brick and terra cotta. In connection with the department of municipal engineering there is a brick-testing laboratory. Here have been tested the bricks used for paving in many cities throughout the State. This laboratory is in charge of Prof. A. N. Talbot and includes both a N. B. M. A. rattler and a Talbot-Jones rattler. Experiments have been carried on for the past five years to improve the method of testing, so that the results may indicate with more certainty the value of the bricks in actual use.



AN INTERESTING SIDE TRIP.

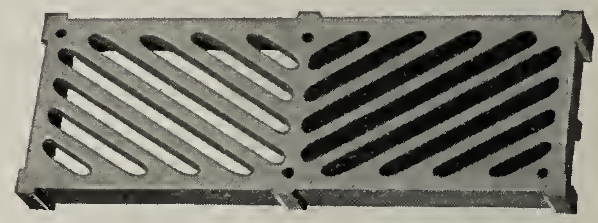
Those who have the hardihood to brave the winter's winds, snow and ice or mud, as the season may provide, will be well repaid for time and trouble if they make the trip to Danville, which is only thirty-three miles from Champaign, and visit the great building and paving brick plant of the Western Brick Company, of which Frank W. Butterworth is president and general manager. A trolley line connects Champaign and Danville, and the seeker after brickyard lore will thus find an easy and quick way to the plant, which runs the year through. While some improvements have been made in the equipment during the year, and a few additional kilns built, they are of the same general character as the old ones and the works present much the same appearance as when the delegates to the convention visited them a year ago. The plant was very fully described in THE CLAY-WORKER for December, 1903, so it will suffice now to say that it is one of the best brickmaking establishments in the Sucker State, and that is the equivalent of saying on the earth. The plant has a daily capacity of 300,000. Both soft and stiff clay brick are made, and every detail of the operation is carried on in the most skillful and economical manner known to the art. Visitors are welcome at all times, but especially convention time. The trolley cars pass the plant.

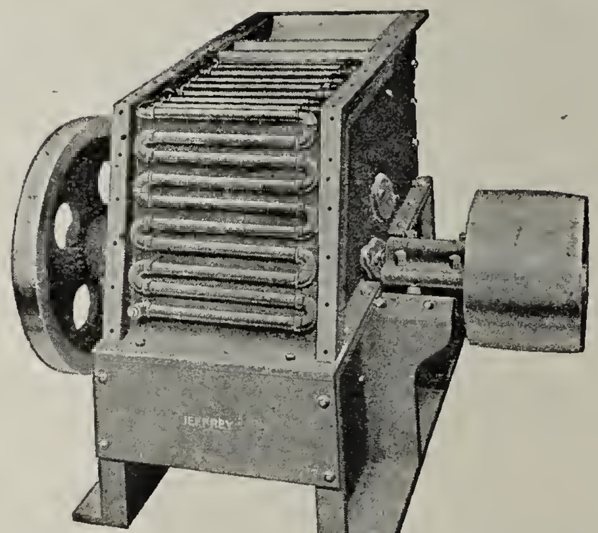
THE JEFFREY SWING HAMMER PULVERIZER.

THE manufacture of this type of pulverizer has recently been taken up by the Jeffrey Manufacturing Co. of Columbus, Ohio, being made under the Schoellhorn-Allbrecht patents acquired by it.

The one illustration shows the pulverizer with its interior or crushing parts; the other shows the sectional screen frame which is one of the special features in this machine.

It is designed for crushing and pulverizing material such as coal, clay, shale, rock and many other materials. The manufacturers claim it to be the simplest machine of its kind made. Strong features are its simple hammer, its "V" shape bar screening surface, its simple adjustment of the beater arms to accommodate wear, its substantial adjustable dust-proof pillow blocks, its top-feed hopper, insuring large capacity and permitting material to be partly crushed while in suspension; all of which go to make this machine as nearly perfect as can be made.





The accessibility of its inner parts is also one of its strong features. The taking off of the rear plate and the hand-hole plates on the side of the machine make it possible to change the beater arms as well as the screening surface when necessary.

The screening surface is made up in sections, so that it is the work of but a few moments to take out or change from one size mesh to another.

Many of these machines are in use, so there is no experimental period to be gone through with.

In treating damp clay the pulverizer is made with a steam jacket, as shown in cut. Its capacity in clay and shale is anywhere from 10,000 to 40,000 bricks daily.

The Jeffrey Co. make free crushing tests for interested parties, thus demonstrating before sale what the machine is capable of doing. Complete catalogue No. 30 on this subject can be had by addressing the manufacturer.

Written for THE CLAY-WORKER.

BALTIMORE BOULDERS.

"Look for trouble and you'll find it."

WALKING AT AN easy pace through the streets of Baltimore, one wonders at the good-nature of its residents in putting up with the discomfort of the ill-paved streets—wonders with gesticulation and an indrawn sense of pain, as the thin-soled boot invites the cobbles to bruise the feet: "Help yourself. These are all the feet I have."

If this city and a few others could adopt the street-cleaning system of Havana, they might well have cause for self-congratulation. Yes, Havana, which has heretofore reveled in a certain sense of dirt and loosely scattered papers, etc., can give us aces and spades and still beat us. The better class teaches the ignorant by setting an example, and the streets are cleaned thoroughly by the wearing system, each man taking pride in his own particular district. A friend of the writer, on a recent visit to Havana, proved herself the exception to the opening clause of this letter. She looked for trouble in the shape of dirt and failed utterly, even thrusting her inquisitive eyes and nose up small alleys. Glory be to the natives, not even a scrap of paper the size of a three-cent piece. Absolute cleanliness. An American casually threw some water, just a half-glassful, from the window. Immediately the protesting voice of a native rose on the air: "Oh, you must not! You must not throw anything, dirty or clean, in the streets!"

Soliloquizing thus, for a moment, on the corner of Charles and Lexington streets, eyes and ears are caught prisoners for the nonce by an obstruction. A darkey driving a mule. Said mule is weary; perhaps the cobbles have soured his disposition also. At any rate, he has determined to rest. Balky? Rather. A white man rushes to the rescue. "Here, I'll start him off for you," emphasizing said kind intention by a gentle coax and a self-confident pull. The mule struggles valiantly for his point of view, and the negro, brimful of vehemence, calls from the wagon: "Hey, dah! W'ot you doin'? Don' yo' know no white man gawn dribe a mule w'ot a darkey ca'an' dribe?" A general laugh followed, in the midst of which the mule amused himself by lying down for a prolonged siesta.

Now, if anything succeeds in putting a bad temper out of business it is an exhibition of another's discomfiture. Still smiling at the incident, my own much-abused feet hastened good-naturedly toward the office of the Baltimore Vitrified Clay Company.

Mr. Bartges, the president, met me with the true spirit of cordiality and chatted freely of their prospects. The company has been incorporated under the Delaware State laws. The charter authorizes the issue of 1,500 shares of preferred stock, par value $100 per share. It is proposed to issue at present 1,000 of these shares, of which 643 have already been subscribed, leaving 357 shares, now offered at par. Preferred stock is entitled to dividends of 7 per cent. per annum out of the earnings before the payment of any dividends on the common stock. Subscriptions are payable as follows: 25 per cent. cash, balance subject to call by board of directors, no call exceeding 25 per cent. each thirty days.

It is proposed to manufacture vitrified paving blocks, fire-proof hollow bricks, sewer pipe, building brick and other clay products.

The company will devote their time at present to building brick, the condition of their surroundings being especially adapted to it. In the spring of the year new machinery will be placed to manufacture vitrified brick, eventually hard brick and sewer pipe.

The yards are situated near Westport, Baltimore county, Maryland, where the company has purchased a tract of 123 acres of virgin soil on the Spring Garden branch of the Patapsco River, frontage 2,000 feet.

The Annapolis Short Line and South Baltimore branches of the B. & O. pass through the property, and the tidewater extension of the Wabash system is near by. They have erected a pier 250 feet in length and are enabled to load four vessels at one time. All of the buildings are under cover, thus enabling employment to men twelve months in the year. The plant possesses all the latest improvements and labor-saving devices in clayworking machinery, which was supplied by the American Clayworking Machinery Company, Bucyrus, Ohio. The daily output of the plant is 50,000 bricks, the tunnel's drying capacity 70,000 bricks.

The patent dryer is a wonderful device of efficiency and economy, all waste steam being utilized for fuel, thus lessening the expense in the manufacture of bricks.

The company will also avail itself of the cheap transportation to Tampa, Fla. The vessels arriving with their loads are glad to take a return load for ballast, therefore a mutually satisfactory and profitable deal is readily made that assures a very cheap freight rate.

When the city of Baltimore has completed the rebuilding of its burnt district (and they are making tremendous headway at present), it will commence the construction of an extensive sewer system; naturally an improved street paving will follow and the now uncomfortable cobblestone pavement will be relegated to the past.

Mr. Bartges gave me the list of officers as follows, after first presenting the secretary, H. L. Carter; C. C. Bartges, president; M. H. Carter, M. D., treasurer; H. L. Carter, secretary.

With an exchange of courteous farewells and mutual good feeling, we parted, the one for a comfortable office chair and resumption of interrupted work, the other for a return over rough cobbles to the opposite corner—and the car. M. E. L.

OHIO STATE UNIVERSITY GETS JAPS WORLD'S FAIR CERAMIC EXHIBIT.

Ohio State University will probably secure the exhibit of the Japanese ceramics schools which attracted so much attention at the St. Louis exposition during the last year. Professor Orton, dean of the engineering and ceramic colleges at the university, when in St. Louis, recently, made partial arrangements for securing the exhibit.

It may be several months before the exhibit arrives at Columbus. All the different samples have to be sent through the custom house, which will consume a long time. Upon the arrival of the different exhibits at the university they will be stored for the present and upon the completion of the mining and ceramics building will be placed in the museum there.

The new acquisitions will more than double the size of the museum and make it by far the best of the kind in the country and one of the most complete in the world. While the exhibits will be primarily for the benefit of the students, yet they will also be most attractive to the sightseer.

Japan submitted the latest developments of her art at the exhibition and the securing of the exhibit practically intact is regarded as of the greatest importance. Highly artistic vases, valuable drawings, experiments in glazing of value to the practical ceramist and molds showing the methods of teaching ceramics in Japan are included in the collection.

THE SUNNY SIDE OF ELECTION TIME.

It has been estimated that $22,000,000 was expended on the election—that is, it cost both parties this vast amount to run the campaign. Perhaps it was worth it. Of one thing, however, the people can be assured. All this money will start circulation. Somebody is better off than he would have been without this business end of the political hornet. Everything will start along now with a full head on.

LAND DRAINAGE

BY J. J. W. BILLINGSLEY

DRAINING THE SOIL.

EMERSON, WHEN asked about the benefits of drainage, said: "There is a farm underneath our farms that we know not of until we underdrain." It is high time that some farmers were drawing on their lower farms, and the only way to do it is through under or tile drainage. Just think of it! Some people supposed to be farmers have been turning their soil five or six inches deep, cultivating, gathering their crop and selling it, and next year turning the other side up growing another crop and selling it, and so on for forty or fifty years, possibly more. If they have not got all the fertility in the amount of soil thus treated they had better give up the job and establish some line of communication with the lower farm and draw on it for the next fifty or sixty years. The only way to do this is to thoroughly underdrain it. A single line of tile in the field is not sufficient. True, it is good as far as it goes, but it doesn't go far enough. One, two or three lines of tile in a field may serve to drain the draws or wet places, but that is all; the higher land is not benefited in the least. The water that falls on the higher ground does not enter the soil where it falls, but runs off over the surface, carrying the vegetable matter and the fertility brought to the surface by the power of attraction just the same as before the tile drains were laid in the lower places, and the waste from cropping and surface washing will go on just the same in the years to come unless the soil is underdrained and thus made porous, so the water will enter the soil where it falls, and thus prevent the surface washing. By underdraining the soil is deepened. In the drift soils fertility will be found at a depth of three or four feet—even more, if the water that fills the spaces between the particles of soil is removed by tile drainage. This admits the air. So in this way soil æration is secured. The oxygen in the air aids decay and chemical changes are effected by which the insoluble fertility deep down in the subsoil is made available for plant growth. There are vast stores of fertility in that lower farm if we but make it available for our crops, and tile drainage is the only effectual way to lay hold on it. It stands to reason that the deeper the soil the more plant food becomes available for plants to use.

Drainage will make close, retentive, sticky soil crumble and fall apart so as to be easily broken, requiring less power and labor to cultivate, and the roots of growing plants penetrate deeply into the earth for food and moisture and in turn decay, leaving millions of little openings down into the earth for the excess of water to pass down and out through the drains, and the air following to fill these openings does its office work.

Drainage increases the warmth of the soil several degrees and aids in the better germination and vigorous growth of the plant. Drained soils may be worked earlier in the spring (often several days) and sooner after rainfalls. So that the cultivation may go on with little hindrance.

Drainage favors the growth of germs which make the nitrogen more available by forming nitrates into a form most useful to plants.

All soils contain more or less of vegetable germs, or plants of a very low order, and by their action or growth in some way cause the oxygen of the air to unite with the nitrogen in the soil and ammonia, thus forming nitrates (or compounds of nitric acid with other substances) in the soil.

Professor Shaw says: "In order that nitrification may take place at least four things are necessary: First, the soil must be sufficiently porous to let the air pass down freely among its particles; second, the soil should be moist, but not wet (an excess of water prevents nitrification); third, the soil must be warm—how warm we cannot say, but nitrification takes place most rapidly at summer temperature and apparently ceases at the freezing point; fourth, the soil must contain lime, soda, potash or similar substances to unite with the nitric acid. These conditions, as far as the farmer can control them, are best secured by under or tile drainage, underdrainage being the base upon which to build for the best soil fertility."

Drainage enables the growing crop to resist the effects of a drouth better, because the roots go deeper early in the season of growth. In seasons of severe drouth the lines of tile drains, where the soil is only partly drained, may be traced by the greener foliage and more vigorous growth of vegetation.

A soil that is wet and then hard when dry will not grow good crops. It is important to drain the excess of water out and get the air in for better soil condition.

With a well-drained, open, porous soil the further improvement of it is easily accomplished by the growing of legume (or nitrogen-gathering) crops. The conditions are every way favorable for them to store fertility in the soil—crops such as clover, cow peas, beans, vetches, etc. In addition, the applied fertility, such as barnyard manures, fertilizers and the use of green crops turned into the soil, are fully utilized, both in the amount of fertility added and in the better texture of the soil, to promote plant growth. Good tile drains properly laid will last (if we may guess at the length of time) a thousand years. This may seem, at first thought, to be an exaggeration, but why not? Tile of a different pattern, though made of clay, and laid in the days of Augustus Cæsar, were dug up a few years ago in a state of good preservation excepting only the wear of the water had creased them slightly. Surface water and the water of rainfalls in filtering through the soil leaves its nutritious elements in the soil for plant growth. The summing up of all these benefits, and many others that might be named, make ideal conditions for growing maximum crops. Such soil improvement is the best possible investment of money and labor to draw upon the future of farming—an investment that never fails, with good husbandlike skill, to declare a satisfactory dividend, let the season be wet or dry.

DEEPER DRAINAGE.

Land owners are waking up to the advantages of deeper drainage. The much greater width drained by a single line of tile, and the increased depth of the soil for the roots of crops to penetrate, is telling in favor of deeper drainage. The effects of such draining in regions where drouths prevail occasionally is very gratifying indeed. The deeper hold of the roots affords the needed moisture, and crops mature notwithstanding the drouth.

A PAYING CROP.

Underdrainage made it possible for Fred Beele, of Tippecanoe county, Indiana, to cut 50 tons of clover hay from 20 acres of land which has been tile drained within the past five years. In September following he harvested 80 bushels of clover seed, which he sold for $410. Estimating the hay at $6 per ton, he has a return of $710 for the products grown on the 20 acres in one season—as much as half the value of the land. Before the land was underdrained it was seldom that they grew a crop that paid for the cultivation.

SOME PRACTICAL SUGGESTIONS.

J. Arnett in the *Irrigation Age* says: "All laterals should be let into Ys in the main on side and never into Ts." The flow of water in a lateral let into a main by a T tends to expend its force of flow on the inner opposite surface of the main, and the flow of the volume of water in the main is impeded by having to overcome the inertia of and set in motion at right angles to its former course the volume of water entering it from the lateral.

The lateral entering the main should start at a depth of not less than four feet, increasing to five feet or more at the main.

In regard to deep underdrainage Mr. Arnett says: "Some farmers advocate the laying of tile at a depth of 20 to 24 inches, for the reason, they say, that in a downpour of rain the water can reach the tile and away so much quicker than if laid deep. That water could reach the tile quicker is true, but with little head to force it on the way compared with the deeply laid drain. The advantage of tile drainage laid to a depth of 4, 5 or 6 feet over drainage to a depth of 20 or 24 inches does not end with the readiness with which the water can reach the drain. Whether hot or cold, rain or shine, snow or blow, day or night, the deeply laid drain is ever at work, so long as any excess of water remains in the soil that its capillary pores cannot hold."

SIZES OF TILE.

In determining the size of tile to be used the amount of rainfall liable to fall in a given time should first be considered. Secondly, the extent of surface to be drained, and thirdly, the rapidity desired to remove the excess of water.

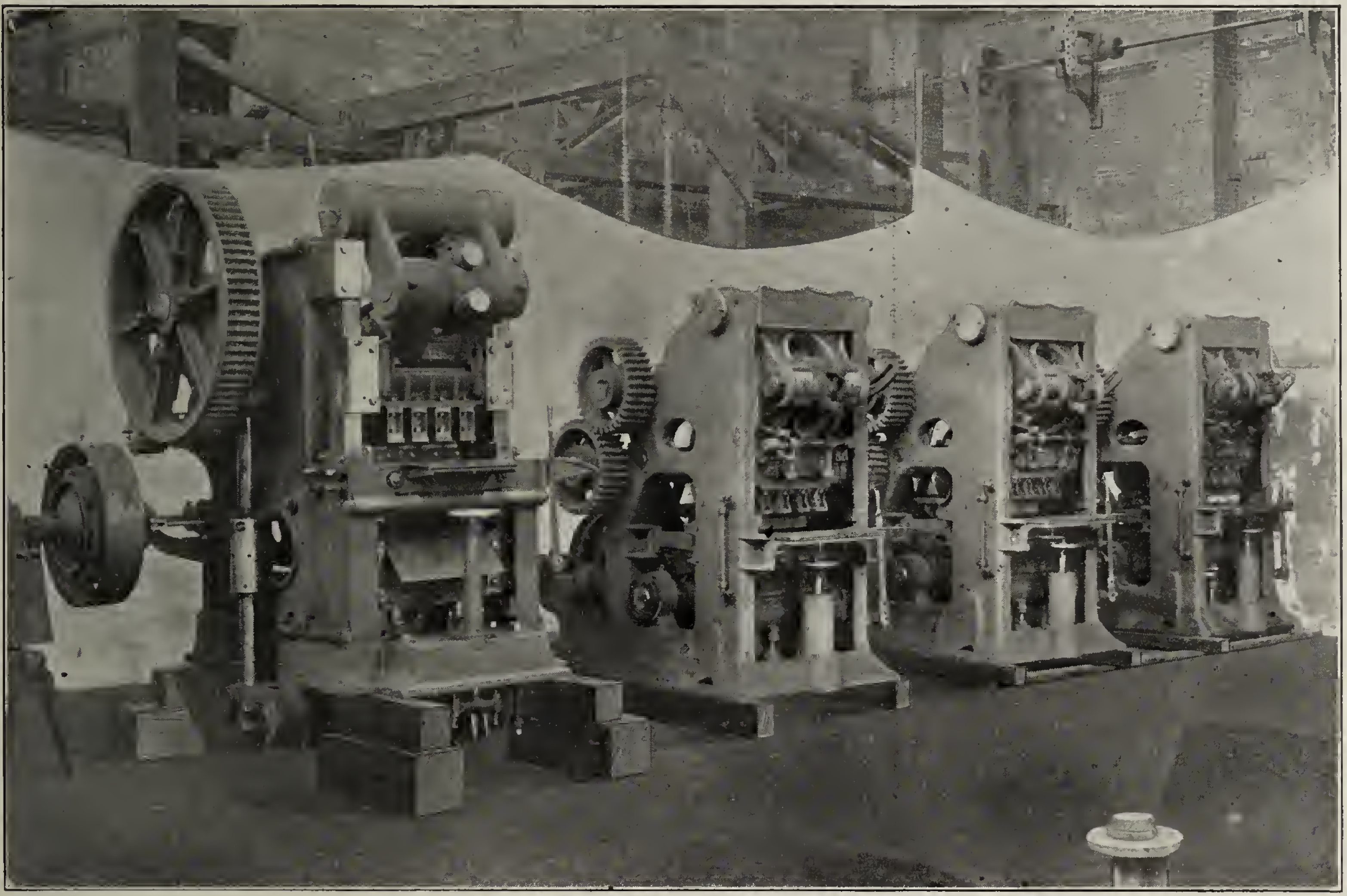
Experiments made in England are no criterion, because there annual rainfall of about 26 inches is distributed through the year, so that but little falls in one day. In some localities in the Mississippi Valley a single shower of three, four or five inches occurs. Well-drained soil may receive and care for such a vast amount of water, but the surplus must be removed before the plants are injured. Upon the basis of such a rainfall the tile to meet emergencies should be twice the diameter required in England, which would give four times the capacity for water delivery.

This is practically what the tile manufacturers recommend. Instead of 1½-inch and 2-inch tiles, nothing less than 4-inch tile should be used, and much larger sizes for main drains. The amount of fall has much to do in determining the size of tile.

A 4-inch tile, with a fall of 6 inches to the 100 feet, delivers water at a velocity of 5.20 feet per second and will discharge 210,396 gallons of water in 24 hours. Knowing the area to be drained and the fall per rod, the required size can be pretty accurately determined. Occasionally men still adhere to the theory that the water passes through the tile instead of entering through the joints. A tile must be very soft to allow the water to pass through the wall of the tile, and unfit for the drain. Use only hard tile for drains.

A STRING OF PRESSES.

THE DRY PRESS departments of the American Clayworking Machinery Company at both the Bucyrus and Willoughby plants have been busy on orders from various parts of the country, which is a gratifying indication that this company's machinery is receiving just recognition. The accompanying photo shows the dry press department of the Willoughby factory, all the machines shown being built on orders and all being ready to go out at about the same time. The first press in the group is the new Model B, especially designed to meet the requirements of the sand-lime brick manufacturers, and whereever else an unusually strong and rigid press may be required. The other three presses shown are of the standard and favorite "D 3 Model," which are quite generally used in dry press plants throughout the country. Such indisputable evidence as this photograph indicates that the clay trade is picking up and gives promise that next season will witness one of the most prosperous seasons the clay manufacturers have ever known. Both plants of the American Clayworking Machinery Company are being operated on full time, and under the management of the new company, which, with ample capital and energy, has acquired both the Bucyrus and Willoughby plants, all contracts, patterns, equipment and good will, and will push the manufacture of clayworking machinery and appliances with the utmost vigor.



A Section of the Erecting Floor in the Shops of the American Clay-Working Machinery Co.

We need the dissemination of ideas of thoroughness and the knowledge necessary to put those ideas into practical use in order that farmers may make the fewest possible mistakes in land drainage.

Written for The Clay-Worker.

NORTHERN OHIO BRICK AND BUILDING NEWS.

THE PRESENT BRICK situation in Toledo is best explained in the language of W. O. Dakin, secretary and treasurer of the Toledo Brick Supply Company, who spoke to the representative of The Clay-Worker as follows: "The brick business is practically dead. There is not one solitary plant now running. There is little demand for brick at the present time. Old jobs are being finished and very few new ones are in sight. Of course, there is always some demand, but it is not what it should be at the present time. The fall has been fine for building, and there are no objections to the present weather even, but somehow there is little doing. As to the prospects for great building activity next season, that is too far ahead. What I might say in that respect just now would be mere talk, with little basis for real foundation. There have been no changes in the prices of brick since last July, $6.25 per thousand being demanded for common building brick throughout the season."

The Toledo Workhouse brick plant has been closed down for the season, with nearly 900,000 bricks on hand, which is just about half the production for the entire season. The average price per thousand is about 25 cents under the regular market quotations. While the labor is practically without cost, yet the institution's plant is not what may be considered self-supporting. Clay is not easy of access, and here is where the big expense comes in. So unprofitable has the plant been in past years that there was a movement to abandon the plant and turn the Workhouse employes to something else which would bring in more ready money for the institution.

Your correspondent has visited almost every one of the two dozen or more architect offices in the city to ascertain the prospects for big building activity during the coming season. Very few of the architects are what might be called real busy, while the most of them are doing very little beyond an odd job now and then. The dullness is expected to continue until the first of the year, when the architects to a man expect to get to work on the foundation of a big season's work. None of the architects spoke discouragingly of the coming season, but all of them expect such building activity as the city has never seen in its history. A number of the architects are working leisurely in getting out preliminary plans for some good-sized buildings. One of these is for a big store room and office building, to cost some over $200,000. A theater is to be included in the plans. It is planned to erect the building in the spring, work to begin as soon as the winter season is over. The structure is to be built of brick.

This is the era of flat building in Toledo. Five years ago there were comparatively very few flat buildings to be found in the city. Referring to the activity in the erection of flat buildings during the past season, there is no exaggeration in the statement to say that there were as many of this class of structures erected during the season just closing as there were built during the previous five years. And the activity is even going to be greater during the coming season than heretofore, if what the architects say can be relied upon. And there is no doubt of this great forthcoming activity, as there is a very strong demand for such structures. The influx of population is very strong. While the increase in population during the past decade was a little better than 61 per cent., it is believed the population is increasing during the present decade at even a greater pace than heretofore. This makes a very strong demand for places to live, and flats seem to be the fad.

During the month of November there were just 92 permits taken out for the erection of all kinds of buildings, the total value of which was placed at $230,485. Three of this number were for flat buildings and 75 for residences. Very few permits, indeed, will be taken out during December. Burton Ames, second assistant city building inspector, stated to the Clay-Worker representative that for five consecutive days during this month already there were no permits of any kind whatever issued. Inspector Ames is of the same opinion as the architects, that the coming season will be full of building activity.

Concrete has made considerable of an inroad on the brick situation during the past season. For foundation construction work it seems now to be used almost exclusively. Many of the architects argue that concrete will get very little beyond being used for foundations and the superstructure of plain buildings. For beauty there is nothing equal to brick, especially pressed brick. And as concrete is now being used, architects contend that it cannot supplant brick for beauty. Some buildings during the past season were erected of building blocks, but architects say that the facing of these blocks is not varied enough to be a good imitation of the real stone construction work. It is also firmly believed that cement will be greatly advanced in price during the coming season, and this will augur well for the brick business. The price of cement is said to be too low; that the different companies have been trying to cut each others' throats in competition to get the trade, and that the price as compared with 1903 is now, and has been throughout the season of 1904, at least 30 per cent. lower. The new building material has had a good introduction while the competitive battle for the trade has been raging, and next season the different companies will go in for making profit, which will necessitate a big raise from the present price. In the face of these conditions it is believed the brick men will have a good inning this next season and will do a big business. It looks very favorable, anyhow.

Among the more recent materialization of building projects are a number of flat buildings to be erected by A. E. Macomber & Co., the brick manufacturers, who recently acquired by purchase considerable valuable vacant property at Twelfth street and Jackson avenue and on Union street. The Macombers have already broken ground for the first structure, which will be rushed to completion as rapidly as possible. The building will be of brick, with stone trimmings. The size of the structure will be 100 feet long and 40 feet wide. The plans as drawn are for three stories; however, it has since been decided to make it four stories instead. There will be sixteen five-room suites, and the architecture will be of Dutch style and strictly modern throughout. Irving Macomber stated to the Clay-Worker man that they intend to erect a half dozen of such flat buildings during the next two years, each to cost in the neighborhood of $25,000.

The biggest project in sight for next season is the Nicholas office and shop building to be erected by the Spitzers, a description of which was given in last month's issue of The Clay-Worker. The big structure calls for the expenditure of $860,000.

Work will soon begin on a new arcade building to be erected at the corner of Madison and Michigan avenues for Willard Robison. The structure will be of brick, will be three stories high, will be L-shaped and will cost about $50,000. It will be especially arranged for bachelors' quarters and will therefore contain twenty suites of three rooms each.

The Hungarian Reformed Church has decided to erect a new parish house to cost about $5,000. The building will be of stone and brick and will be erected in the spring.

It is rumored that two more stories are to be added to the Boody House, and that the improvement will cost in the neighborhood of $150,000. If the project materializes brick will enter almost exclusively into the construction, and the hotel will have added 150 rooms to the present quarters.

Work will be begun in the spring to add four stories to the Chamber of Commerce building, making it ten stories. Brick will be used and the cost of the improvement will be about $50,000.

There is to be considerable activity in the line of paving, repaving and sewerage work during the next season, as a statement was recently given out that the city would require at least $250,000 to pay its share of the expense. This is nearly the amount that was expended during the past season, which has been the biggest in the history of the city. In the neighborhood of forty streets, long and short, were paved and repaved during the season. It is proposed to pave twenty streets next year at the city's share of expense of about $30,000. The greatest share of expense the city will have will be for the repaving of twenty thoroughfares at a cost of nearly $180,000. For sewer work about $40,000 will be expended.

It is said that a company is being organized for the purpose of manufacturing cement shingles. According to the information at hand, the company will erect a plant here after the details of organization have been perfected.

William A. Hart, of this city, has filed a petition in bankruptcy against the Ziegler Filter and Pottery Company to recover money loaned to the concern and salary for services as manager. He claims there is due him $1,260. A schedule as filed shows the liabilities to be $5,079.61, with no assets. Of the liabilities nearly $4,000 is unsecured in any way. For some time two suits have been pending in Common Pleas Court against the bankrupt company. One of these was brought by Charles A. Ziegler for services and which is disputed by the company. The other was by Milton Taylor for certain claims against the concern. William Steusloff is now in possession of the property. Through the bankruptcy proceedings it is aimed to bring all the claims into one action and cause a final settlement to be made. T. O. D.

Written for The Clay-Worker.

THE BRICK AND BUILDING SITUATION IN CLEVELAND.

AS THE cold weather has set in and much of work that consumes brick has to be stopped, it gives us an opportunity to look over what has been done here during the last year in the city of Cleveland.

For the last ten years the problem of giving the inhabitants of our city pure water from the lake has been agitated. Two factors united together to pollute the water pumped from Division street water works on the West Side, which caused many cases of typhoid fever and other ailments. The first cause was that all the sewage from the city was emptied into the lake through the sewers, and the second cause was that the water for the city's consumption was drawn from the lake too near where the sewage was emptied in. The crib was but two and one-half miles from shore.

To counteract these two evils two other improvements were started. One was to build a tunnel under the lake until pure water was reached, which easily could be procured five miles from shore. This tunnel, nine feet in diameter, was finished last spring, and a new pumping station on the East Side at Kirkland street is now sending clear water from the river west to Collinwood east, through all that territory. The amount of brick (which were all hard-burned shale brick)used can be imagined when we consider a wall thick enough to keep out the pressure of the water above, thirty feet in circumference, 26,000 feet long, with the cribs and pump house added.

The other improvement in connection with this will require even more brick. This is an intercepting sewer, thirteen feet in diameter, which starts west on Lake street, running parallel with the lake, theoretically, and empties therein over eight miles east, north of Collinwood, the current of the lake being in that direction. When done all the sewers of the city are to empty into this monster sewer. A greater work than the celebrated sewer in old Rome, called the Cloaca Maxima, which was larger in diameter, but had a flat bottom, causing the sewage to adhere, generate foul gases, and proved a menace to health, instead of a sanitary measures, as intended.

This intercepting sewer is about half finished under all kinds of difficulties, the greatest just now is that the people of Cleveland, although voting strongly for Roosevelt, defeated the issuing of the necessary sewer bonds. It was a very foolish proceeding, as the work is approved by every sensible voter and is a necessity. Not all are sensible voters, however.

The soil through which the sewer passes is mostly sand, from 10 to 30 feet deep, the balance below being shale. Here, near where the writer lives, it is 40 feet to the bottom. Owing to the sand, steel piling from 20 to 30 feet long have to be driven in on both sides before any excavating can be done. Many places have to be mined, owing to the improvement on the surface. The incline of this long hole underground is only one-half inch to every 100 feet. Sufficient current to keep it clean is expected from the great pressure behind, from the many sewers connected with it. Here in Glenville, which soon will be a ward of the city of Cleveland, having been voted in by both cities, we have a sewage disposal plant. This, of course, will be abandoned (although it is the only proper way to take care of sewage) when the main sewer is finished.

A word about this mode of disposing of sewage may be interesting to some of the readers. Cleveland, Chicago and all the large cities will have to adopt some plan similar to this in use here. It is inexpensive and practical. One man takes care of the whole plant and the chemicals to precipitate the solids from the water are only about two grains of alum and 8 grains of lime to the gallon of sewage. The settlings or sludge are pumped into filter presses. While the water runs off clear, the solids make a good fertilizing element, instead of causing trouble, sickness and damage suits, owing to its contamination.

Glenville is building two large sewers now, while the city of Cleveland finished ten sewers, commenced last year. Commenced 63 sewers and finished them this year, while four will go over into next year.

This means an immense amount of brick to be put out of sight underground. This, however, is only a portion of the brick we have consumed the last year. Contracts were given out for the paving of 113 streets. Of these 101 are paved with brick, 3 with asphalt and 9 with Medina stone.

The whole amount of paving of streets will figure up to 25.5 miles for this year. This does not include Glenville, East Cleveland, South Brooklyn, Newburg and Lakewood, all of which have done their share in this line also.

The amount of paving done, mostly in brick, in the city during the last five years was: In 1899, 78 streets; 1900, 68 streets; 1901, 67 streets; 1902, 67 streets; 1903, 72 streets. I regret that I am unable to give the amount of brick all these city improvements consumed. It would be interesting to know the aggregate amount.

The building trade has kept pace with these prosperous times. In all directions, wherever you go, you see new apartment houses and flats, not only in the city, but also in the suburbs. Rockefeller's million dollar skyscraper is nearly closed in, while Harkness Brown's is being finished. The First Methodist Church, which was bought by a syndicate for $500,000, is now to be torn down and an elegant bank building is to go on its site. The Federal Building on the square is going up slowly, and the ground toward the lake for the group plan is being cleared of buildings. F. E. F.

OBITUARY.

G. W. Sharer—Philadelphia.

George W. Sharer was born in Stratford, Ohio, April 23, 1844, where he lived till the beginning of the Civil War. He enlisted in Company C, 4th Reg., Ohio Vol. Inf., and served three years and three months. Returning to Delaware he worked at his trade (mason) for a few years. He was married in 1866. His first connection with clayworking was in 1869, when he began the manufacture of drain tile near the town of Delaware. After a year or two he began making brick and made the first machine brick in that part of the country. Early in 1876 he moved to Indiana, and in 1880 went to Terre Haute, where he built his first dryer, from which was evolved the Sharer Dryer, which was patented in April, 1885. From December, 1884, his time was spent in selling and building dryers in all parts of the United States and Canada. He came to Philadelphia in 1888, opened an office, and established his home. In 1899 his health began to fail, but he kept at work as long as possible. In January, 1902, a stroke of paralysis compelled him to rest for some time, and a lighter stroke in June, 1903, was the beginning of the end, though he rallied and was able to be about part of the time till April, 1904, from which time he was confined to his room and bed till he passed away on December 2, 1904.

Proceedings of the First Annual Convention

—OF THE—

National Association Manufacturers Sand=Lime Products,

—HELD AT—

Cincinnati, Ohio, December 5 and 6, 1904.

THE GATHERING and organization of the National Association of Sand-Lime Manufacturers at Cincinnati, Ohio, we have a notable instance of history repeating itself, for the meetings were held in the very room where the National Brick Manufacturers' Association was organized, September 22, 1886, and where the nineteenth annual convention of that body was held, February last. As Mr. Randall remarked during preliminary session, it is to be hoped that the new organization may prosper and grow steadily from year to year, as has the National Brick Manufacturers' Association, and if it does, it will prove a powerful influence for good in the upbuilding of the sand-lime brick industry. The meeting was similar in many ways to that held nineteen years ago. The same enthusiasm that has always characterized the N. B. M. A. conventions was noticeable, every delegate evincing the keenest interest in every matter considered after the permanent organization had been effected.

THE FIRST SESSION.

The meeting was called to order by Mr. H. de Joannis, who voluntarily assumed the duties of temporary chairman, saying that it was his privilege and pleasure to call to order the first National meeting of American manufacturers of sand-lime brick, and after congratulating those present on the auspicious beginning, he read a draft of the Constitution and By-Laws, which he stated was copied from that of the N. B. M. A., and which was afterwards submitted to a committee composed of J. J. Davis, H. O. Duerr, H. O. Keener and G. W. Straight, and the document as finally adopted is as follows:

CONSTITUTION OF THE NATIONAL ASSOCIATION OF MANUFACTURERS OF SAND-LIME PRODUCTS.

ARTICLE I.

NAME.

The Association shall be known as the NATIONAL ASSOCIATION OF MANUFACTURERS OF SAND-LIME PRODUCTS.

ARTICLE II.

OBJECTS.

The objects of this Association shall be:

First—To promote the interests of those engaged in the manufacture of all sand-lime products, by the discussion of all questions pertaining thereto.

Second—To establish and maintain more intimate and friendly relations between manufacturers of sand-lime products.

ARTICLE III.

All persons, firms or corporations in good standing, directly interested in the objects of this Association are eligible to membership.

Application for membership must be made through the Secretary of the Association upon the printed form provided by the Association, and be accompanied by the admission fee of ten dollars.

Application for membership may be made by individuals or companies, but only one vote will be allowed for each membership.

Each applicant for membership shall be submitted to the Executive Committee at its first meeting subsequent to its receipt by the Secretary, and the Executive Committee shall have the right and privilege or rejecting the application of any person, firm or corporation deemed untrustworthy of election to membership, a two-thirds vote being necessary to rejection. Any applicant having been rejected by the Executive Committee shall have the right of appeal to the Association.

ARTICLE IV.

FEES AND DUES.

The initiation fee for each member shall be ten dollars and the membership dues of each member five dollars a year thereafter, payable in advance.

Members not paying their dues within thirty days after due notice of delinquency by the Secretary shall forfeit their membership and may be dropped from the roll, and the Executive Committee shall have the right to suspend any member guilty of ungentlemanly or unbusiness-like conduct. Any member so suspended shall have the right of appeal to the Association.

Trade journals may be made honorary members, exempt from initiation fee and annual dues.

ARTICLE V.

MEETINGS.

The meetings of this Association shall be held annually, at such time and place as may be determined by the Executive Committee, public notice of same to be given two months before the time of meeting.

ARTICLE VI.

OFFICERS.

The officers of this Association shall consist of a President, one Vice-President, a Secretary and a Treasurer, who shall be elected by ballot at each regular annual meeting from among those members of the Association who shall be in the active manufacture of sand-lime products, provided that no person shall be eligible to the presidency who has not attended one previous convention.

It shall be the duty of the President to preside at all meetings of this Association, and in all rulings and decisions in the transaction of the business of the Association, he shall be governed by the usual parliamentary rules governing similar bodies.

It shall be the duty of the Vice-President to perform the duties of the President in the latter's absence.

It shall be the duty of the Secretary to keep a record of each meeting, and he shall also receive all moneys and pay them over to the Treasurer, keep an account, make a full report at each annual meeting, conduct all necessary correspondence, and transact such business as the Association may direct.

It shall be the duty of the Treasurer to receive from the Secretary all moneys belonging to this Association and receipt for them and keep an accurate account of and pay out the same upon the order of the Association, signed by the President and countersigned by the Secretary and make a full report at each regular meeting.

The Secretary and Treasurer of this Association shall be required to give a bond of one thousand dollars each, said bond to be approved by the executive Committee.

ARTICLE VII.

EXECUTIVE COMMITTEE.

SECTION 1. The Executive Committee shall consist of the officers of the Association and the three members elected annually.

SEC. 2. It shall be the duty of the Executive Committee to fix the salaries and provide for the expenses, make the necessary arrangements for all meetings, and perform such duties as may be assigned it.

SEC. 3. At any meeting of the Committee, four members shall constitute a quorum.

ARTICLE VIII.

VACANCIES—AMENDMENTS.

In case of death, or removal for any cause, of any officer of this Association, the vacancy may be filled by the Executive Committee until the next annual election.

This Constitution may be altered or amended by a two-thirds vote of the members present at any annual meeting; written notice of proposed changes having been sent to the membership sixty days in advance of the meeting.

The Election of Officers.

The Nominating Committee appointed by the temporary Chairman, composed of J. L. Jackson, Wm. King, W. K. Squier, W. N. Durbin, L. W. Penfield, Robert Whealy, and L. J. Smith, reported their unanimous choice to be

President, W. K. Squier, Syracuse, N. Y.
Vice-President, Robert E. Dolan, Denver, Colo.

Treasurer, Wm. King, Cedar Rapids, Iowa.
Secretary, H. O. Duerr, Wilmington, Dela.

Mr. Jackson moved the unanimous election of the officers named, which carried. It then developed that the Constitution provided for a vote by ballot. This detail was accomplished by Mr. Randall moving that the Temporary Chairman cast the unanimous ballot of the Association, which carried. The ballot was cast and the gentlemen were thereupon inducted into office.

President Squier: Gentlemen, I am considerably embarrassed by this distinction, having been a member of the Nominating Committee. I tried to induce the committee to select someone else, but they outvoted me. I appreciate the honor you have conferred upon me and while the office has come to me unsought, I accept it and will put forth every effort to promote the best interests of this organization and its members. (Applause.)

Vice-President R. E. Dolan was then introduced, and thanked the gentlemen for the recognition paid him, declared he would prove his appreciation by laboring in season and out of season in the interest of the Association, and closed with a cordial invitation to the members to hold the next convention in Denver.

The treasurer, Mr. Wm. King, on being introduced, thanked the members heartily, saying it was the first convention of the character that he had ever attended, that he had come to the meeting for the purpose of increasing his stock of knowledge, little anticipating that he would have the honor of an office thrust upon him.

The Secretary, H. O. Duerr, was greeted with a hearty round of applause when he ascended the platform, and in return thanked those present for the distinction accorded him, adding that he appreciated the fact that it was not an empty honor, but that there was a lot of hard work to be done, and promising to do his level best.

President Squier announced that the next in order was the report of the Committee on programme, composed of L. S. Anderson, Frank S. Bond, George E. Dean, I. W. Millholland and J. S. Palmer, and provided for the following order of business.

THE PROGRAM.

Paper by R. E. Dolan, Denver.

Talk on "A Model Sand Lime Brick Plant," H. O. Duerr, of Wilmington, and discussion.

"How to Get Sand-Lime Brick Before the Public," J. L. Jackson, Saginaw.

"Treatment of Lime After Hydration," W. K. Squier, of Syracuse.

"Methods of Manufacture," S. V. Peppel, Louisville, Ky.

DELEGATES TO THE CONVENTION OF NATIONAL ASSOCIATION OF MANUFACTURERS OF SAND-LIME PRODUCTS, CINCINNATI, DECEMBER 5 AND 6, 1904.

Front row beginning on the left—W. A. Eudaly, Cincinnati, Ohio; S. A. Williams, Cleveland, Ohio; Wm. King, Cedar Rapids, Iowa; S. V. Peppel, Louisville, Ky.; John J. Moroney, Chicago, Ill.: Harry De Joannis, Chicago, Ill.; P. P. Tafel, Cleveland, Ohio; Geo. H. Hartwell, Chicago, Ill.

Second row—S. T. Hendricks, Sibley, Mich.; L. S. Anderson, Geneva, Pa.; W. K. Squier, Syracuse, N. Y.; Frank S. Bond, Lake Helen, Fla.; J. S. Palmer, Sebewaing, Mich.; H. O. Keener, New York City; H. O. Duerr, Wilmington, Del.; S. J. Scott, Columbus, Ohio.

Third row—A. J. Johnson, Sioux Falls, S. D.; H. C. Schlegel, Daleville, Ind.; A. J. Pick, West Bend, Wis.; G. W. Straight, Holland, Mich.; L. Reeber, Marion, Ohio; Wm. N. Durbin, Anderson, Ind.; E. T. Slider, New Albany, Ind.

Top row—L. J. Smith, Marion, Ohio; J. A. Warrick, Marion, Ohio; J. W. Milholland, Marion, Ohio; J. F. Scott, Saginaw, Mich.; W. J. Carmicheal, Wellsburg, W. Va.; Geo. E. Dean, Jackson, Mich.; Geo. W. Balkwill, Cleveland, Ohio; J. L. Jackson, Saginaw, Mich.: T. A. Randall, Indianapolis, Ind.; R. E. Dolan, Denver, Col.

"Silo Systems Sand-Lime Brick Manufacture," A. J. Johnson, Sioux Falls, S. D.

"Drying Sand," P. L. Simpson, Chicago.

"Cost of Manufacture," J. S. Palmer, Sebewaing, Mich.

"Shall the Sand-Lime Brick Men Join the National Brick Manufacturers' Association?" W. K. Squier, of Syracuse.

"What Are the Brick and Other Trade Journals Going to Do For the Sand-Lime Brick Industry?" T. A. Randall and E. H. Defebaugh.

"Advertising," H. De Joannis.

Questions From Members Answered by S. V. Peppel.

Mr. James J. Davis, of Elwood, Ind., won the affection of the representatives of the trade press present by moving that they be made honorary members of the Association, exempt from dues. This was carried unanimously.

President Squier: Gentlemen, we will now take up the regular order of business, and listen to the first paper on "Sand-Lime Brick in Colorado," by Mr. Robert E. Dolan, Denver.

"SAND-LIME BRICK IN COLORADO."

Colorado, perhaps at this time justly known in the East as the hot-bed of all kinds of trouble, is nevertheless equally the center of all new thought, whether in labor struggles or experiments in newer development. Situated at the top of things terrestrially, with mountains sufficiently high and vast to form the roof of the world, Colorado has forged ahead in all possible lines of physical development. Within her borders, all possible industrial interests find a base of operations. Of her gold, silver and other precious metals, the world has full knowledge. Equally well known are the vast stores of iron and coal, sufficient to care for the world, if other supplies were to cease. But even above all these vast storehouses of wealth, her fertile valleys, watered by a thousand streams, have demonstrated an agricultural wealth, and with irrigation, a certainty of abundant harvests, that even now have overshadowed the mineral production of the State. Everything of value in the way of agricultural products, save corn and its sublimation, Bourbon whisky, is produced, of the best quality and in tremendous abundance. Colorado can furnish flour, potatoes, cantaloupes par excellence; even the children cry for the brand "Colorado" on their breakfast foods. And then we also have scenery to back the productions; so that not only is the stomach well fed, but the eye is gratified at the same time. But enough of this boasting; it is sufficient to say that the State of Colorado now holds and maintains in comfort over half a million of men, women and children; all healthy and hustling. She can supply herself from her own resources, with all the necessities of life and most of the luxuries; no enterprise can be thought of that cannot find the raw materials at hand for use. She is a state in and for herself and is the true example of these great United States.

Along the easterly border of the foothills, the first suggestion of the mighty ranges lying further west, running from north to south of the entire state, lies a range of hills, commonly known as the hog-backs, on account of their precipitous rise from the plains, and in the distance resembling the backs of the world-famous razor-backs of the South. These hills do not contain gold or other precious metals, but are exceedingly rich throughout their entire length in all that is essential to brickmaking. Not only are clays, fire clays, cements and other kindred products in abundance, but as well and in far larger areas, are found lime stone and silica of a quality equal to the best. Nature in a kindly mood, perhaps anticipating a tardy coming of the sand-lime brick and its ultimate victory in the strife of competition, wisely placed the limes and the silicates side by side, as if ready to be united into the king of bricks.

It is a point in these foothills, about twenty miles from Denver, that the company which I represent found the materials from which we propose to make the brick that will make the State of Colorado famous. Both the limestone and silica of great purity lie side by side at our works, with fuel just a short distance away. Early in the year we were attracted to the portion of country adjoining our works, and at the same time became interested in the idea of making the sand-lime brick in the Far West. Before acting definitely on the matter, we selected materials from the ground which we afterwards acquired and sent them East to a number of plants for inspection and testing. These materials were made up at several different plants, and under slightly different processes. On receiving the bricks, we proceeded with a thorough and exhaustive test as to their quality. Several were sent to the School of Mines at Golden, and, as is the case with everything else in Colorado, including men, they were submitted to as severe a test as could be made. Mr. Claude W. LeFilkins, of the School, who had charge of the tests, found the crushing strength of the brick per square inch to be over 7,300 pounds; he would have probably found it still greater, but the brick broke his machine, and so we were forced to be content with 7,300 pounds pressure. He tried it with the acid test and found practically no trace of efflorescent matter; and his report is that there is practically no defacing matter to be found in the brick. The only difficulty that he had with the brick was that it absolutely refused to take water, immersion for forty-four hours in distilled water developing an absorption of but 11.9 per cent. of the weight of the brick. On the whole, he reported the brick to be absolutely first-class. I have a sample with me and will be pleased to show what we can do in Colorado.

Our silica comes to the manufacturer in a dry state and is 97 per cent. pure silica, with a trace of iron and alumina; the limestone is 96½ per cent. calcium, with a trace of magnesium. We believe that we have the materials to make a brick that will be a credit to the industry and fully trust that we will bring no discredit upon this association by reason of inferior results obtained in our operations. Of course, with us, we have not advanced beyond the point of belief; our plant is not yet completed, and so far we have not manufactured any brick commercially. We believe that we will join the ranks of producers within the coming six weeks. The demand for a good building brick in Colorado is very great. There are few plants making a superior brick in the state, and they are working to capacity all the time. These are all clay brick manufacturers, and our plant will be the first to compete with the old ideas of the West. However, we will not be alone in the field. At Colorado Springs, about fifty miles to the south from our plant, a second sand-lime brick company has commenced construction. Their plant will be ready for operation at about the same time as ours, and the campaign of education of builders in Colorado will soon commence. As representing an infant industry and far from the other manufacturers of this class of brick, we wish for your hearty assistance wherever it is practicable to give it. Architects require proofs, and it may be that their inquiries in the East may be submitted to you, directly or indirectly. If such be the case, help us out in the work. Much, of course, has been written of the quality of the sand-lime brick in the past few years, but a word from one who knows, given directly to the man who wants to know, is worth pages of general discussion.

The City of Denver is the field where we hope to be most active. It is a city of 170,000 population, and is in the front rank in the quality of its buildings, both business and residence. It seems to me that it would be fitting if this Association could make it the next place of meeting. We can always guarantee perfect weather, magnificent scenery and a good time, and we usually also guarantee fair transportation rates as well. For praise of Denver and the scenic features of Colorado, I respectfully refer you to the railroad companies. For praise of Denver as a convention city, I am proud to refer you to any Association that ever had a convention there. It is a city that knows how, and does not stop with the knowing; it does things. I can assure you that no one who takes the trip to the City Beautiful will regret it; and it is my earnest desire that you may all come and gather there, representing the industry so young and so vigorous. I thank you.

COLORADO SCHOOL OF MINES,
VICTOR C. ALDERSON, PRESIDENT.
DEPARTMENT OF MECHANICS AND CONSTRUCTION.
GOLDEN, COLO., April 23, 1904.

The Silicated Brick Company, Denver Colo.:

DEAR SIRS.—The silicated bricks submitted to me by you have an indicated crushing strength of over 7,300 pounds per square inch. The whole brick, when tested flat, had a crushing strength, without signs of rupture, greater than the capacity of the 100,000 pounds testing machine.

The acid test, *i. e.*, immersion in a solution of water 99 per cent., hydrochloric acid .5 per cent. and sulphuric acid .5 per cent., indicates practically no trace of efflorescent matter. The solution loosens clean grains of sand only, and these have no permanent defacing properties.

After drying nine weeks in a steam heated room (a severe test), immersion in distilled water for forty-four hours, and drying four hours in a steam heated room, the brick show an absorption of 11.9 per cent. of their weight.

The bricks present high-grade qualities and properties in all of the above. The form is regular, the texture is uniform and compact. The bricks are evidently a first-class building brick.

Very truly yours,
CLAUDE W. LEFILKINS.

President Squier: The next number on the programme is an address by our Secretary, "Talk on Model Sand-Lime Brick Plant," by H. O. Duerr, Wilmington, Delaware.

"TALK ON MODEL SAND-LIME BRICK PLANT."

"It would be rather difficult to say what a model sand-lime brick plant is, since the ideas of men differ so materially on this point. Each man thinks that he has the only system or the only combination of various systems which will make just the kind of plant that every one should have. Five years ago I was in the crushed stone business; in an effort to find some means of using the fine material which was accumulating as a by-product at our quarries, I came in contact with the cement brick proposition and investigated that, but finally abandoned it as too expensive. For the last two years I have been interested in sand and lime, so went after the sand-lime brick proposition, and, after having visited a great many plants, trying to cover all types of plants, and in different sections of the country, and having interviewed the various manufacturers, I felt that there was no one system which would give me all that I wanted.

At first, owing to the fact that all of these manufacturers were very good talkers and very convincing in their ways, when one of them would come to see me and talk to me for a day, I would feel thoroughly convinced that they had the only proposition there was. It was not worth while to think about anything else, but after sleeping over it and having a little time to think for myself, I could always find holes in some of their arguments and was compelled to take a different view.

After getting through with all of them it seemed as if nothing was sure. Therefore we decided to go ahead along lines which our judgment seemed to say were best, and use such parts of the various systems as we felt, under our own working conditions, would bring the best results. We tried to find out where the mistakes had been made in the various plants, and we must say that we were met almost universally with courteous treatment and were given information freely. As a result our plant has been built with a view of eliminating as many of the mistakes which were made by others as possible.

We can hardly say that it is a model plant, but it represents our ideas. We have had many visitors at our plant; some of them have made good suggestions; others have made suggestions that were entirely untenable. We need not only the good ideas and bad ideas, but must profit by the mistakes made by others in order to get a good plant. I knew a gentleman once who had been sent to Europe with a view of getting information to build a steel plant. He came home with all the good ideas that he was able to pick up over there, and with all these good ideas proceeded to build a steel plant, but all of the good ideas did not make a good steel plant.

We figured on three things in building our plant: First, good machinery; second, economy in handling, and, third, good product. Our sand is pumped from the river, landed at the dock and conveyed to the top of the building, all mechanically. We aimed to eliminate labor at every point possible. Another thing that I observed in my travels was that a great many brick were broken by either poor tracks or poorly laid tracks. I, therefore, embedded my tracks in concrete and laid them in such a way as to eliminate all jar. We do another thing which is not generally practiced, and that is, we remove the bricks from the press on a pallet instead of taking them direct to the car. We find this is better because a man can lift a pallet of four bricks from the press to the table and two boys can set them on the car from this pallet. It does not take a large number of pallets, because they are emptied very quickly.

I found early that moisture had a very decided effect on the density of the brick and that the many ways of measuring did not seem to be sufficiently accurate to suit me. I, therefore, weigh everything, and one man is able to do the weighing and mixing. We did not at first use a dryer, but we expect to put in one. Another thing that we do is that we have one man who does nothing but move the cars, when loaded at the press, to the cylinder and out again, because carelessness at that point is apt to mean a loss of brick. My cylinders and tracks are so located that there is a grade sufficient that practically all we need to do with a string of cars is to release them and let them run from the inside of the cylinder into the yard.

I have had this matter of association in mind for some time and have been in correspondence with quite a few people, and one of the replies I got on this score was to the effect that this man thought it was of no use for him to join the association. He said many will go there with a view to getting all that they can and all the information they want, and still be unwilling to give any information themselves. Now this is entirely wrong. The general ideas of the manufacture of sand-lime brick is pretty well known. While each one has some little detail that he thinks may be of some special advantage to him, it is hardly likely that any single man's idea is so far in advance of his neighbor's that he would be able to keep any one out of the business by withholding that knowledge. We should give each other all that we can. I have never talked with any one, even if I did the bulk of the talking myself, without leaving with some new idea or some new suggestion. There is one thing certain—we must not make poor brick, or if we do make them, we must not allow them to get on the market, because a few failures will do them more harm than can be wiped out by the expenditure of a great deal of money and energy.

So far as we are concerned, I believe that it is necessary for the best results that we get our brick into the cylinder promptly after being pressed. However, this may not be a general application, since I find that there are many here who have had some experience in that line who seem to feel that it is not necessary for them to do so. There is one thing that is sure. If the brick stand around in the air for some time, a portion of the lime is bound to take carbon dioxide from the air, removing that much of the lime which would be available for the formation of the silicate bond, and is the thing that we are after. Even though this carbonate might not disintegrate later, it will not give quite as hard a brick, and I should be afraid that such a brick, even though they looked and seemed all right at the time of manufacture, might eventually peel in the wall, and we cannot afford to have anything of that sort happen.

Mr. King stated that he had made brick on Friday and had occasion to hold them over until Monday night before he hardened them and that he watched these brick pretty closely and had examined them, but had failed to find any difference either in the color or the hardness, and he suggested that where bank sand is used and the brick are allowed to stand after pressing, before being hardened, there is almost sure to be discoloration, which he believed was due to vegetable matter, and that he was using a clean river sand.

Mr. Squier said that he got discoloration under these conditions, but no weakness, so far as he could see. They use a very pure bank sand, but their practice was to get it into the cylinder as early as possible.

Mr. Duerr stated that he was using a river sand which analyzed 99.2 per cent. silicate, the balance being made up of iron and potash.

Mr. Dean said that when their brick stood over Sunday, he could detect no weakness, but got bad color, and that on another occasion he had had some brick stand ten days in the hardening cylinder with the door off and these were hardened at the same time with some which had been made on the same day, and if there was any difference, those which had stood the longest were the hardest, and those which had stood ten days were only discolored at the place where the dust from their dryer had been able to get to them.

Mr. King then stated that possibly his lime had had something to do with the discoloration of his brick, as it was very high in moisture.

Mr. Duerr then asked Mr. Dean whether he had examined his brick recently. Mr. Dean said that they had been on the pile for two months after being made and that they were all right then, but that he could not very well examine them now, as they were in the bottom of a sewer. Mr. Duerr thought that was a very good place for them.

Mr. Palmer then asked Mr. Peppel what was the action of air upon lime hydrate when in the brick before hardening.

In reply, Mr. Peppel stated that the lime hydrate in the brick which had just been pressed was in the most favorable condition for the absorption of carbon dioxide, which is always in the air, because the lime hydrate was present there in a well-distributed form and that there was also moisture present. Both quick-lime and hydrated lime took up carbon dioxide with much greater rapidity in the presence of moisture than they did when in a practically dry state. The resultant product of the exposure of a mixture containing calcium oxide or any hydrate, is a carbonate of lime similar to what is better known as air slaked lime. This carbonate, so far as silicate formation is concerned, seems to be almost inert, because when he undertook to make a sand-lime brick by using, instead of lime, nothing but thoroughly air slaked lime, the brick when they came from the hardening cylinder showed almost no strength at all. The action of air on moist brick which are left to stand over for a few days or a few weeks is, of course, to give you a case hardened surface, and if exposed long enough you would eventually have a weak mortar brick in which there is no bond, but a filler which consists of calcium carbonate.

Mr. Anderson then stated that they got a distinct difference of color on standing, and this suggested the possibility of their running two different kinds of brick—that is, getting two colors without the addition of any coloring matter—but he did not state whether they had entered the market in this way. By letting some of his bricks stand three weeks they had gotten vary hard. In fact, so hard that some visitors picked them up and thought they had been properly manufactured brick, although they had never been in the hardening cylinder. He also said that the discoloration was clear through the brick and not a surface affection only.

Mr. Dean, however, had found that so far as his brick was concerned, the discoloration was only skin deep.

Mr. Duerr suggested that he would like to have some information as to the quantities of lime or percentage of lime the people were using. That he had been experimenting along the line, to some extent, and had made the tests by using all the way from three up to ten per cent. of caustic lime, and that after he had concluded that he got better results with the use of 5 per cent. of caustic lime than he had with the use of more, stating that when he used as much as 8 per cent. his brick were extremely hard and too brittle to be really good. While Mr. Duerr thought that this was the proper amount for them to use, he said he believed that each man had to work out the most desirable amount to use; that with different materials, different kinds of sand, it is probable that different quantities of lime would be desirable, indicating that the amount of interstitial spaces in the sand would have a marked influence upon it.

Mr. Dolan was of the same opinion.

Mr. Peppel then cited that he had obtained a crushing strength of 9,000 pounds per square inch with a brick that contained 10 per cent. of lime, and also pointed out further that in experiments running from 5 to 20 per cent. of lime, that with each increase of lime there was an increase of strength up to that point, but that the increment of increase became less with each addition to the percentage of lime. Also that sands which had clay in them gave better results with a higher percentage of lime. That is, the increase of lime seemed to overcome, to some extent, the bad effects of the clay. He also said that the amount of very fine material available for the lime to combine with would be quite a factor, because if the interstitial spaces were large there would be pretty sure to be pockets of lime which could not take enough silicate from the surface of the large particles to completely convert the lime into silicate. The result would be large particles of silica covered by a coat of silicate of calcium which inclosed and completely surrounded a nucleus of uncombined lime, but if there was very fine silica which helped to fill up these interstitial spaces, the little pocket which was originally filled with lime would be filled with a mixture of silica and lime in sufficiently close contact that chemical union could take place and the result would be a solid mass of calcium silicate instead of nucleus of lime surrounded by calcium silicate.

Mr. Anderson said that they got the best results with 7 per cent. of quicklime.

Mr. Squier said that he had come to the conclusion that each sand deposit had its own individuality, that each plant had its own individuality, and that each man worked out for himself certain facts and factors which were constants for that plant alone, and that each man must determine for himself what quantity of lime was best to use.

Mr. Carmichael called attention to the fact that sand banks frequently vary quite a good deal in the make up of the material form top to bottom.

Mr. Duerr then asked how many had made mechanical tests of their sand and suggested the desirability of doing that, and went on to state that by separating his sand through sieves and making a mechanical analysis of it, his sand showed 3 per cent. between 16 and 20 mesh; 5 per cent. between 20 and 30 mesh; 15 per cent. between 30 and 40 mesh; 60 per cent. between 50 and 70 mesh, and the balance changed finally on down to and beyond 150 mesh. While this gave him a variety of sizes, he was not entirely satisfied, and went ahead and ground some of this sand so that it all passed 100 mesh, and then made up a number of brick with varying amounts of this fine material added to it and tested these brick, and found that he got the best results from his sand just as it came from the river, and that nothing was to be gained in this case by the addition of fine material, but Mr. Duerr clearly indicated that there were undoubtedy cases where it would be necessary to do something in order to produce greater variety of sizes, as there are some sands which are almost uniform in size of grain. Almost none of those present had had their sand analyzed, either as to its chemical or physical character.

There were those who were anxious to know what Mr. Milholland thought was a model plant, because they had heard him saying things in little "button-hole" talks about what a nice plant they had, so it was up to him to make good.

Mr. Milholland said that he did not know whether he had a model plant or not, but they had built their plant with a view to having a good plant rather than a cheap one, and that they had done everything they knew in order to make it as handy as possible. They had bricked in their entire plant and said further that they did not grind any sand, and when asked if they were using bank sand he said they had used both bank and lake sand. He said he thought they would get a little better brick, perhaps, if they ground it finer, but thus far they had never done so. Lake sand, he said, gave brick a little lighter in color than the bank sand.

Mr. Slider wanted to know if it was advisable to put in sheds or whether it was better to store the brick in the open. Mr. Carmichael in reply said he believed it would be advisable to use sheds for storage if you were making a face brick and wished to enter that market, because if the brick were not protected from the weather, the moisture, soot and dust, would have a tendency to discolor them and make them look rather shabby as compared with a nice, clean brick, but for the common run of brick, he did not think it necessary.

Mr. Slider then asked if it was a fact that wet brick will not do so well nor stand so well as dry. He said his experience had been that when his brick was thoroughly wet they were softer than the thoroughly dry brick. This brought forward the experience of several of the manufacturers, and Mr. Anderson said that the masons told him that the brick was harder to cut when wet than when dry. However, he covers his brick with sheds in order to keep out the water, and also on account of convenience in handling in all kinds of weather.

President Squier had tested his brick by putting them in the drip from a roof on the sunny side so that they alternately froze and thawed during all of last winter, and he thought last winter was a pretty severe test of anything, especially up in his section, and he said that on examining them this spring the center of the brick was apparently the softest part of the brick, and appealed to Mr. Peppel for any information he might be able to give.

Mr. Peppel called attention to the fact that there was to be found in every brick made, at least a very small proportion of the lime which did not have sufficient contact with silica to be converted into silicate, and that on immersion in water and subsequent drying out by the air, which made a carbonate harder than the lime and would thus give not only a denser, but a harder brick. This action would not materially increase the tensile strength, but would increase the crushing strength. In his own experience, in making tests on the weathering quality of the material, he found this very well shown by the different behavior of samples quite low and quite high in lime. Those high in lime showed quite a material increase in crushing strength after repeated freezing and thawing out in hot water, and it so happened that this hot water was found later to contain considerable quantities of carbon dioxide in solution. The brick high in calcium was materially increased in crushing strength by this treatment, the tensile strength decreased rather than increased, so that it is probable that the exposure of almost any sand-lime brick after it has been properly hardened to the action of water and air, will tend to make a slightly harder brick, at least on the surface. With a brick below 10 per cent. of lime which has been properly hardened, from well mixed material, there will probably be a very little increase in strength. However, it is very gratifying to note that the tendency is in the right direction, an increase rather than a decrease as time goes on.

The remarks of Mr. Peppel were well supported by a statement of Mr. Duerr, who built his plant from the first brick made, which was not of the quality which they are making to-day. Shortly after putting up this plant there was a very heavy rain and Mr. Duerr observed moisture on the inside walls. About three months afterwards there was another rain of the same sort, very heavy and driving, and in every way equal in severity to the first one. Having observed that moisture was apparently coming through in the first place, Mr. Duerr's curiosity had been excited and he examined the walls very carefully and on the second occasion and much to his surprise, found there was absolutely no evidence of moisture coming through. What had happened, of course, was that there was probably a little lime which had not been converted into silicate. This, under the action of moisture, and carbon doxide, had solidified into carbonate and filled the pores.

Adjourned to 9 a. m.

TUESDAY MORNING SESSION.

When the officers of the Association assembled in the Convention hall Tuesday morning, they found that a majority of the members had absented themselves for the purpose of visiting a sand-lime brick plant in the suburbs of the city, so it was necessary to defer calling the meeting to order until nearly 11 o'clock, when the business of the Convention was again resumed.

President Squier: Gentlemen, we are late in getting under way this morning, so we must try to get down to business as quickly as possible. The first in order will be the report of Mr. Bolton Smith, Chairman of the Committee on Resolutions.

Mr. Smith responded with the following resolution of thanks, which was carried unanimously by a rising vote.

RESOLUTION OF THANKS TENDERED H. DE JOANNIS.

WHEREAS, We, the National Association of Manufacturers of Sand-Lime Products, are deeply indebted to Mr. Harry De Joannis, of Chicago, for the painstaking and effective work he has done in our behalf by instigating and arranging for the organization of the Association and unanimously tender him our earnest thanks for bringing us together as manufacturers. We believe that great good will result; that our Association will prove of inestimable value to all identified with the sand-lime industry, and therefore desire to manifest our thorough appreciation of Mr. De Joannis' efforts in our behalf by a formal vote of thanks, which we sincerely tender to him.

President Squier: It will be in order at this time to complete our Executive Committee by the election of three members, who, in addition to the officers, will constitute that Committee.

On motion, the following gentlemen were elected to serve in that capacity: L. S. Anderson, Geneva, Pa., Bolton Smith, Memphis, Tenn., Frank S. Bond, DeLand, Fla.

Mr. Jackson: I would suggest that a committee on Promotion or Publicity be appointed by the president, to gather statistics and information which may be put before architects and insurance men for the purpose of securing the recognition of the merits of sand-lime brick as a building material.

The motion was seconded and carried, and J. L. Jackson, George E. Dean and S. L. Anderson were so appointed.

President Squier: Gentlemen, I am advised that Mr. Simpson, of Chicago, who is down on this afternoon's programme, will be obliged to leave at noon, so we will now hear his paper.

DRYING SAND.

P. L. SIMPSON, CHICAGO, ILL.

Preliminary to a discussion of drying sand for the manufacture of sand-lime brick, a thought prominently presents itself to me—that the principal object that every manufacturer should have, and which is no doubt one of the main objects of this convention, is the possibility, and, indeed, in many cases the actual necessity, of making better brick.

It is practically a new industry, and, naturally, we are all more or less receptive to any new ideas that will make our product better.

There is no doubt that many plants have been erected in a slovenly, slip-shod and unmechanical manner, and the result is that in many instances the industry is in a somewhat chaotic condition. The causes leading to this condition are, of course, various

One cause is ignorance of the business, some contractors having actually attempted to install sand-lime brick plants without any previous knowledge of the business. Another cause is the desire to erect plants with an equipment of machinery totally inadequate for the work: not only from the point of view of economy of production, but also from a scientific standpoint.

As an enthusiast in sand-lime brick, I am, therefore, in view of these facts, an advocate of Sauer and more scientific methods in sand-lime brick making.

The whole subject resolves itself into a question for the mechanical engineer. The chemist has told of the chemical action or reaction involved in the phenomena that takes place in the hardening cylinder, and no doubt we will find his services quite invaluable to us in many ways, but after a particular sand has been tested with a particular form of lime, then it is for the mechanical engineer to get down on his drawing board and so arrange machines of certain types that will accomplish the very best results obtainable at the smallest minimum of cost.

According to my ideas, the main pre-requisites for the making of a first-class sand-lime brick, are:

First, perfect hydration of the lime.

Second, perfect mixing of the sand and lime.

Third, perfect pressing of the mixture.

And along with the latter, careful handling of the brick after they are made. These primary essentials look towards the attainment of a first-class brick, and if all are accomplished no doubt a first-class brick will result. But how many manufacturers in these United States actually accomplish or realize these primary requirements? How many men in this convention believe that they have attained these results without the shadow of a doubt in their minds? I take it that few would stand up and state that they had absolutely reached that goal.

To these three primary requisites, I would add a fourth, viz., Uniformity of product. How is this obtainable? My answer is by a scientific and mechanical construction of a plant so that every minute's production will be alike; and to obtain this desired result it seems to me that a proper apparatus for drying the sand is necessary.

At the inception of the sand-lime brick industry into this country, dryers for drying the sand were lost sight of; it was something that it was felt might be necessary, but was put off until the time would come in the course of events when it became absolutely necessary. Even to-day, quite a number of plants are running without using a dryer, and some contractors are erecting plants where a dryer is not even considered in the equipment.

Bear in mind, our works can no longer be termed "brickyards," but factories, and we have the advantage over old-fashioned brickmaking of being able to make brick regardless of climatic conditions. But our sand is outside of our factories—subject to all the various vicissitudes of the weather. The sand is therefore found in different conditions of moisture—sometimes very wet, sometimes the opposite, but rarely the latter. It is, therefore, reasonable to suppose that in order to establish uniformity in a plant, the sand must be reduced to a definite and uniform condition. Surely no one will argue proper methods are followed when sand is brought in from the field in various conditions of wetness and expect that the mixture will be uniform, or that the condition of the mixture as it enters the press will be uniform, and if it is not as near uniform as possible, the pressing of the bricks is invariably imperfect. Those concerns who adhere to this manner of handling their sand will doubtless soon realize (as many are doing to-day) the necessity of drying the sand so that a uniform product may result. I do not think, therefore, that any successful argument can be raised against the necessity of using a dryer for the successful manufacture of sand-lime brick.

The next point is the kind of dryer to use. The market to-day is full of various apparatus for drying different substances, one of the most common being the rotary dryer. The disadvantage of this method is the amount of power and fuel required to run them, for unless they are a good size, the capacity will be inadequate. A rotary dryer is all the more objectionable if the sand should come in contact with the products of combustion, so that from the point of view of economy of power and general efficiency there it no doubt that for sand a pipe dryer is to be preferred.

It would, of course, be out of place for me to take advantage of this opportunity to exploit the advantages of any one form of pipes, but I will only say that should any one believe that a mere aggregation of steam pipes, one above the other, will dry sand, he is very much mistaken. There we have a pipe dryer, say five or six feet wide, eighteen or twenty feet long, with, say two feet of wet sand piled up above the tiers of pipes. Now, how is the moisture to get out of that sand? Evidently the bottom of the pile must be the hottest, and, therefore, the moisture must ascend through the mass of wet sand. It is not all apt to do this, and consequently some other means are necessary to get rid of the moisture.

In the most approved of pipe dryers—and which was the result of a long experience in drying sand for glassmaking purposes—it was found that by introducing pipes of four or five inches in diameter, slotted in the lower side of the same, across the longitudinal drying pipes, that then the moisture would entrain into these transverse slots and thereby the moisture would leave the sand as fast as it was formed. This result is all the more readily attained by the introduction of an air duct running lengthwise of the dryer, connected with these tranverse or moisture pipes, and this air duct, being connected with a fan or high chimney to induce sufficient draft. This is an invention patented by an Illinois gentleman, Mr. John Finlay, some years ago.

Another advantage of a pipe dryer is that it need not be located on the ground floor of the factory as a rotary dryer must be, but may be installed upstairs in close proximity to the lime bin, and thereby one man can attend to both.

I have heard it argued that a proper mixture cannot be attained when sand is as dry as it is possible to make it. I was under that idea myself at one time, but experience has dispelled this illusion. There is glutinous condition enough to lime to enable it to stick to the particles of sand, no matter how dry.

In conclusion, I would urge all manufacturers of sand-lime brick to be content with nothing but the best. But do not be afraid to discard the old in favor of the new when you are convinced that by so doing you will be able to better your product, cheapen your production and advance the art of sand-lime brick-making

DISCUSSION.

At the opening of the discussion, Mr. Duerr was unable to see where the economy came in because when live steam was used you could only get 60 per cent. efficiency. This suggested that exhaust steam might be used and a number of those present gave their experience in that line, many of them having tried it.

Mr. Straight, who has had a great deal of experience in lumber dryers, said that he always used the exhaust steam and thereby gained large economy. He said that there were two things that you must do with a dryer. The first one was to remove the moisture from the material, and the second one was that as soon as it was out of the material it must be removed from the room, and quoted Mr. Simpson's statement that an aggregation of pipes was not all that was necessary. He also said he had been using live steam on his sand dryer, but he would soon have his arrangements shaped around so that he would do his drying with exhaust steam. He said the cost of drying depended upon the cost of heat units, and that by using exhaust steam you saved just so much by using a certain amount of heat which you otherwise allowed to go to waste. He said with a header of 5½ feet, 2 inch pipe, 1¼ inch space and good ventilation, you could throw wet sand on and dry very satisfactorily. Of course this gave a limit to the quantity which can be handled. With a 40 h. p. engine the exhaust steam you get will dry 7 to 8 cubic yards in 10 hours. He said it was probable that with the use of exhaust steam, more steam would be required than the power used at the sand brick plant will furnish.

Someone suggested that Mr. Hendricks had an exhaust steam dryer at Sibley and Mr. Hendricks said that it was insufficient and that it was possible that with more pipe they could get larger drying capacity, but that he did not believe their power would furnish sufficient exhaust steam to do the work.

Mr. King stated that he had fourteen years experience with the use of dryers on other material, and said that he had put in steam dryers at an expenditure of $7,000, one time, but that he pulled them out and was using a rotary dryer 22 inches in diameter by 22 feet long, with a fall of 6 inches from end to end. He had this bricked in and arched over. The rate of feed through this machinery is regulated by a change of slant. He is now getting through from 40 to 50 yards per day, with a fuel cost of 700 pounds of coal for ten hours. The sand goes in here the second day after it comes from the river, so that it is pretty wet yet.

When asked, Mr. King was unable to state what percentage of moisture it had. Mr. King uses no baffel plates, but just depends upon the lap and rivets to agitate and distribute the sand.

When asked just how the heat traveled through the dryer, Mr. King said that it was just a direct draft, using a furnace with a bridge wall.

Mr. Dean was using a sand dryer and direct heat rotary with pockets. The dryer is 30 feet long and the draft is aided by use of a fan. There is only 4 inch fall in the 30 feet and the dryer is run at 300 to 400 revolutions per minute. Capacity is 40 to 50 yards of bank sand, using from 600 to 800 pounds of coal, but after a rain he cannot get near that capacity. He said, "We run our dryer at a pretty high temperature and find that if we get it too hot it darkens our sand. We bring our sand in by team and a scraper."

Mr. Carmichael then asked: "Does the action of the gases have any effect upon the future bonding in brick?"

Mr. Dean had been unable to detect any effect on the strength of the brick due to this cause.

Mr. Duerr then asked Mr. Jackson if the amount of exhaust necessary to do the drying work could not be calculated, and was answered in the affirmative.

Mr. Squier had tried several rotaries at Buffalo, Scranton and elsewhere, but they only have one now in use and expect to throw that out and introduce steam before long. However, if you have clay in your sand he does not recommend steam, but otherwise considers it the best. He said that he did not care to say anything about this type of dryer at this time because the manager of the Scranton plant was interested in their type of dryer, but that if anyone wished they could correspond with Mr. Merriman. In connection with the dryer proposition, President Squier said that they greatly preferred uncracked sand, especially for the plaster business; that is, sand dried at a low heat. Mr. Duerr then wished to know if he could get any data as to the amount of exhaust needed to dry sand. He could not give definite data, but stated that they dried from 80 to 90 yards of sand with their exhaust steam, but not in ten hours. They would take advantage of having the system full of exhaust when they shut down and holding it and would use live steam right away in the morning in order to get the dryer heated up as quickly as possible.

Mr. Smith was getting good results from a dryer 15 feet long and 9 feet high, but was using live steam because the exhaust was not sufficient.

Mr. Carmichael suggested that it would be advisable to use a little live steam at night and also asked whether the steam was not utilized in discharging their kettles or hardening cylinders.

Mr. Simpson suggested that those that were interested should go to Ottawa, Ill., where they could see dryers with a capacity of 300 tons or more per day, and could probably get actual figures as to cost.

President Squier: If there is no further discussion on this subject we will now listen to an address on "How to Get Sand-Lime Brick Before the Public," by J. L. Jackson, Saginaw, Mich.

HOW TO GET SAND-LIME BRICK BEFORE THE PUBLIC.

By J. L. Jackson, Saginaw, Mich.

Mr. Jackson gave a very interesting talk on the above subject, but as we have no copy of this paper we do not think it would be safe to quote. Mr. Jackson said, however, that they had met very strenuous opposition from the clay brick people, and that everything possible had been done by them to discourage the use of sand-lime brick, and that they had gone so far as to use every means to influence engineers and architects and prejudice them against artificial stone and sand-lime brick in particular.

He felt that it was of vital importance that the Association and the manufacturers of sand-lime brick do something in the way of acquainting architects, engineers and contractors with a better knowledge of this material.

We must do everything in our power in the way of spreading information as to what buildings have been put up, how long they have been up, where they are located, who the architects and engineers were that recommended them, who the contractor was that put them up, so that the architect and engineer who is desirous of knowing anything about it can go and see for himself and not take our word for it.

Our road was made easy for us by the fact that we were interested in a sugar factory, and our engineer there kept complaining to us about the poor clay brick which he had to lay up and so had to take out and put in new after a year or two, and this was the way in which our attention was first called to the sand-lime brick.

This man was a German and kept saying to us that if we had sand-lime brick we would not have this trouble, and we finally got enthusiastic over the matter and went to Germany and came back and induced our friends to put their money into the business, but not until we had sent our sand to Germany, had it tested, bricks made, brought them back and called a meeting of the architects, builders and engineers of our city.

We explained the matter to them all, and on the strength of the encouragement that we received at that meeting we organized our company and went ahead as manufacturers of sand-lime brick. We used our first output largely in building our own plant. We started up about two years ago in November, and by January we had half a million of bricks upon our yard.

The same architects, builders and masons who had given us encouragement at the start turned us down. We felt discouraged, but could not back out, because we had not only some of our own money, but that of our friends, which had to be taken care of.

Finally the sugar factory took a few and tested them in various ways as to the action of sulphuric acid which might be in the flue gases, as to whether they could stand water and frost and as to whether they had sufficient strength for their purposes.

They could at once see that they excelled in appearance. They were satisfied fully and before June they had used over a million. The masons and architects are still skeptical and are undoubtedly prejudiced in favor of clay. I cannot see why clay men take the attitude they do toward us, because other material is getting very scarce and sand-lime brick is inducing people to put up brick houses where they never thought of doing so before.

Owing to the fact that the clay brick people and the cement brick and concrete manufacturers are both knocking us and doing everything in their power to prejudice people against us, it is absolutely essential that we stand together and take an aggressive attitude in going after the business as well as the introduction of progressive and up-to-date methods of practically forcing the architects and engineers to recognize the merits of our material.

We have a large number of testimonial letters as to the quality of sand-lime brick, and you are all welcome to read them over and make copies of any you desire. The St. Louis Chemical Company, after very thorough and careful examination of our material, have bought large quantities of sand-lime brick, and in many instances they have used them to replace clay brick. They have given us a very flattering testimonial letter.

DISCUSSION.

Mr. Anderson then suggested that it might be wise for the association to prepare a bulletin or something of that sort, which would contain pictures of prominent buildings in which sand-lime brick were used, giving the architects who had recommended it, or specified it, the engineers in the case as well as the contractors. Further, this should contain pictures and descriptions of various plants as well as a large number of testimonial letters which are already in the hands of various manufacturers and that each manufacturer should subscribe before hand, indicating how many he would take for his own use. This bulletin might be called "Sand-Lime Brick in America."

The suggestion that this matter be left to the consideration of the Executive Committee, who would, at some later time, after having gone over the matter fully, advise the Association as a whole, as to what they considered best on this score.

The convention then adjourned and the members assembled in front of the main entrance to the Grand Hotel, where a fine group picture was taken.

MINUTES OF THE MEETING OF THE EXECUTIVE COMMITTEE.

At 1 P. M. a meeting of the Executive Committee was held.

At this meeting the Secretary was instructed to obtain such stationary as was necessary and was authorized to incur such expenses as he might deem necessary for the proper conducting of the business of the Association.

The Secretary was also authorized to form a set of by-laws for the Association and obtain testimonial letters from builders, architects and engineers and contractors who had used sand-lime brick, also such photographs of prominent buildings as might be acceptable in the formation of a pamphlet to be published by the Association for the benefit of the members.

The Secretary was also instructed to take up the question of bringing the manufacturers of sand-lime brick before the notice of the Government Geological Survey in order that they might make an investigation of this industry.

TUESDAY AFTERNOON SESSION.

The meeting was called to order at 1:40 P. M.

President Squier spoke at some length on "Treatment of Lime After Hydration," and then called on Mr. Peppel for the following paper:

METHODS OF MANUFACTURE.

By S. V. Peppel.

(This was discussed in rather a brief form, and many details which were passed over hastily by him were taken up in the discussion which followed. Mr. Peppel said in substance as follows):

He felt it rather an embarrassing question to discuss in the presence of a number of machinery men who undoubtedly felt that they each had the best that could be produced, and after mentioning those firms who are known as promoters of some system or other of their own, or some special design of plants which they advocate building, called attention to the fact that there were in the field two free lances; by that meaning there were two firms who were building plants along their own lines, trying to utilize what they saw and believed to be the best in each process or system that had come under their notice, both of these men having spent considerable time and money in visiting other plants and in reviewing all information that was at hand. These two men were Mr. Duerr, of Wilmington, Del., and Mr. Dolan, of Denver, Colo.

Mr. Peppel expressed a desire to see and study these two plants, which were of greater interest to him than had been any other one plant. The building of these plants had been more or less along the line of thought which he had after seeing many plants. He had not been entirely satisfied with any one of them, and felt that there were a great many cases where a combination of the parts of the so-called systems or processes would be a desirable thing to install.

There is no question but that the building of plants has gone down to a machinery basis, and, for the most part, sand-lime brick plants will be built under the same conditions as are the clay brick plants, and it is also probable that nearly every large clay brick concern will be in the market to furnish the machinery complete for sand-lime brick plants.

The time for the sale of blue sky in the sand-lime brick business has passed, and it is one of the things that has materially retarded the more rapid development of the industry; yet I do not think we want to complain on this score, although it might have been more rapid than it is had it been only a machinery proposition from the start.

Talking about the matter of raw materials, we have but two things to consider, in one sense of the word; that is, sand and lime. On this score we thoroughly believe that too little attention is paid to the physical character of the raw materials, especially the sand. Investigation has shown clearly that by a proper gradation of size a denser brick can be made as well as one that will take a higher crushing strength.

The effect of the introduction of a very fine ground sand into a coarser mixture is to slightly lessen the crushing strength and increase the tensile strength. The physical character of the sand is in all probability the reason why the same lime does not apparently give the same results for the two different sands, or, in other words, is probably the cause why a different percentage of lime is best for one man and a higher or lower percentage better for another manufacturer.

If we had the mechanical analysis of the various sands in use, their chemical compositions and the amount of lime that these manufacturers have found to give them the best results, we would probably find a very close analogy of the percentage of lime used to the amount of voids in the sand. Of course, it is well known that any large per cent. of loam or clay in the sand will render it a dangerous proposition on account of the poor weathering quality of the material produced.

On the lime question it has been shown clearly that the high calcium lime is the more desirable of the two types. The high calcium lime will produce a greater strength per unit than will a unit of magnesian or dolomite lime, and it stands to reason that the purer lime will be the cheaper to use, as you can usually buy a pure lime for the same price as an impure one. So far as the lime is concerned, there are two general processes, one which might be called the oxide process, which might be divided into two sections, one in which the material travels continuously from its entrance to the mixing device until it reaches the hardening cylinder after having passed through the press; the other the silo system, in which, after mixing, the material is stopped in its route to the press and allowed to digest or ripen from twelve to forty-eight hours. This latter or silo system will soon be a thing of the past. The American people do not believe in waiting for a thing to ripen; they want them to go right straight along without any sidetracking. The oxide process, however, cannot be used with all kinds of lime; it is only the very high calcium limes which will slack completely enough to make it a safe proposition, but with a comparatively pure sand and a very high calcium lime it can be successfully used.

With reference to the mixture, of course, everybody realizes that thorough mixing is very necesary and that most of the accidents to our presses have come from a lack of regularity in our mixing arrangements. This mixing will be done wet or dry, or both combined. It is far easier to get a complete incorporation by being able to mix dry sand and dry lime than it is to mix when either is wet; for this reason a preliminary mixing dry before the addition of water will not only give more complete incorporation, but it will probably be done with less power and be more even. It does not require such a great lot of mixing after the water is added, provided you have a thorough incorporation of the two materials before the water reaches it. The introduction of water into this material is entirely different from that of clay, because this material being more or less course grained, the water travels over it with great facility.

Various mixing machines are being used, and among them the tube mill. There is no question but the tube mill will give good results so far as a complete distribution of materials is concerned, but experience indicates that the introduction of lime into a sand mixture materially cuts down the capacity of the tube mill for carrying material through it, and it is probable that those plants that now have tube mills for the grinding of a portion of their sand into a very fine powder which they will incorporate with the lime and a coarser sand, doing their mixing mainly by other means.

In the process of manufacture the press is being given more thought to-day than any other one piece of machinery. It has been shown by careful work that the production of the best possible brick when working on fairly dry mixture, a very high pressure is required, however, there are some reasons why this pressure will not be used in a commercial way. One of these is the additional cost of machinery heavy enough to stand the strain as well as the additional power. Aside from this when using such pressure, the abrasion of the mold liners is materially increased. This abrasion will increase the staining of a brick by matallic iron, which, of course, is an undesirable feature. Therefore, in a commercial way a happy medium will have to be adopted, and with a presure on the press sufficient to develop an abundance of strength to answer all ordinary building requirements the disagreeable features above mentioned are almost entirely eliminated.

On account of the difficulty of maintaining the moisture condition and the size grain of the mixture always the same, as well as the difficulty of always getting into the mold exactly the same amount of lime. Presses used under a high pressure with no release are very susceptible to break-downs, for this reason a hydraulic press would seem to have points in its favor.

It is a question of whether you want a brick of a uniform hardness or brick of uniform size. With a hydraulic press or a press which has some means of release beyond a certain pressure, there would be fewer break-downs, and if you occasionally obtain a large brick it could be thrown away. It has also been shown that it is a desirable thing to deliver pressure from both sides that is, from top and bottom.

There was a great deal of discussion following this talk, during which Mr. Simpson pointed out a number of reasons or rather objections, to hydraulic presses. A number of questions were asked and answered by Mr. Peppel, but the answers for the most part have been embodied in what is given above.

COST OF MOLD LINERS, ETC.

A more interesting discussion then occurred with reference to liners for the molds. This was handled by Mr. J. L. Jackson, Mr. J. F. Scott, Mr. J. W. Milholland and others. The discussion principally had the effect that there was very wide difference in the amout of brick one firm was able to make with one set of liners as compared with his neighbors. The wear on the liners is probably a factor of two things; first, the hardness of the liners; second, the physical character of the sand.

Mr. Jackson had tried both hard and soft steel and chilled iron, and had finally come to the conclusion that a mild steel with five to eight per cent. of carbon was the best thing to use, because it wore fairly well and was not near so hard to dress, and could be hammered and reground without great difficulty. He has recently taken up the question of facing the liners with saw-blade stuff, which you can buy sheared to the desired size.

Mr. Scott, who had been using liners faced with saw-blade for sometime, and was probably one of the first ones to introduce it, said he could get 150,000 brick without changing his liners.

Mr. Millholland stated that the liners which the Anderson Foundry and Machine people had made for him made 1,100,000 brick and were now just ready to put in the third set of liners, and that they had done no regrinding.

Mr. Duerr had been experimenting along this line also, and is getting the best results with very hard plowshare steel electrically welded to soft steel backs, and he had been trying that in comparison with some other liners, by lining one mold of a press with one kind and another mold with another kind of liner so as to get comparative data. Mr. Duerr, as well as many others, had many inquiries from manufacturers on this point, as to how long liners will wear and what is the very best way of handling them. Nearly all of the liners vary in the wearing; that is, two molds wearing side by side, of the same material, day after day, would nearly always show a greater wear in one than the other, notwithstanding the fact that so far as they were able to determine, the liners were of the same hardness exactly.

Mr. Balkwell stated that they obtained the best results by using an extremely hard steel, welded to soft steel backs, after which the whole was tempered.

The best Mr. Johnson had ever been able to do with his press was 150,000 with one grinding.

Disston & Sons have been furnishing some of these saw-blade press liners.

Mr. Scott was very strongly in favor of concave liners, especially when using saw-blades as the wearing surface.

The matter of heating the molds and dies was discussed at length by Messrs. Jackson, Dean, Duerr, Bond, Schlegel and others. The result rather indicated that the majority of them were heating their molds, and that by heating them, materially reduced the tendency of the brick to stick to the die head. However, a few of them seemed to have a material of such a nature that they had no trouble on this score without heating.

THE SILO SYSTEM.

Mr. Johnson said he presumed they had about the oldest silo system plant which was still being operated along that line. He stated that he felt that it was desirable and that they always did leave their material in the silo after it was mixed and tempered for the proper ripening of the material. He said that they had no trouble with their material getting hard in the silo, but their greatest difficulty was in getting the proper amount of moisture. It is probably that on different days the difference in the amount of moisture in the air influenced it and then again the top of the silo will be much dryer than the bottom and that it sometimes was sufficiently different to make a little trouble in the press.

Mr. Jackson then asked Mr. Peppel what he considered the best method of manufacture. That is, whether to use lime hydrated prior to being mixed with the same or whether to use quicklime and hydrate it during the mixing process.

Mr. Peppel replied that local conditions and the material which he would be compelled to work with should be the governing factor in determining which would be the most desirable, because with certain kinds of lime it would be absolutely impossible to work on the quicklime process, but that there were cases where with sand of proper quality and a very high calcium lime available, it probably would be desirable to install this sort of process from the point of economy, and that if everything was properly adjusted, the materials could move by being passed through mixing machines at a slow rate, so that no silo would be needed, and it could pass right through the press.

Mr. Duerr had tried the quicklime process and obtained fully 75 per cent. of his batches all right, and found that fifteen minutes from the time the water was added until the material struck the press was sufficient.

Mr. Peppel's idea was that about twenty minutes would be all right.

Until recently Mr. Jackson had stood entirely for the hydrated lime process, but he had a long conversation with a professor who had talked in such a manner that Mr. Jackson concluded that it was worth a little study and thought on his part.

The question was then brought up as to whether the chemical reaction, or silicate forming reaction, starts before it strikes the hardening cylinder. This matter was discussed by Mr. Peppel, Mr. Dolan and others, and it was thought that while the reaction probably did start even in the cold, or moderately cold material, it was of extremely small importance. That it would take a long while before enough would be converted into silicate to be of importance. However, hydrating and mixing, as Mr. Duerr did with the mixing apparatus heated externally and steam within the mixing machine, there undoubtedly would be some reaction started. Nothing has been done to show whether the starting of this reaction is an advantage or a disadvantage. It is pretty sure to be one or the other, but probably not a material one.

THE COST OF MANUFACTURE.

By J. S. Palmer.

I cannot answer definitely, but can talk to you in the light of my own experience. In conversation with other manufacturers as to cost, I have come to the conclusion that many of them do not include in their costs all that should be taken into consideration. Many of them seem to stop when they have counted lime, sand, fuel and labor, but the real cost is everything, even up to and including the cost of selling. Now this would include lime, sand, fuel, labor, repairs and incidentals, interest on investment, which should not be less than 5 per cent., superintendence, office expenses, cost of marketing, advertising, and some little provision should be made aside from this for depreciation in property, the amount of this depending, of course, on whether you own your own sand bank, lime kilns and things of that sort. Brick are costing between $4.50 and $5.00 per thousand.

The discussion suggested that a man should figure that his plant would have to be replaced in ten years, not necessarily because it would be worn out, but because his machinery would be so out-of-date by that time that he would have to replace it with new machinery.

Mr. Duerr said that many men had written him asking about the profits of the business, etc., and he replied to them that if they were going in just for a flyer, and did not want to take it up as a business and give it their personal attention, they had better stay out of it, but with good management there was good profit to be had, and it would give them more to think of than anything else that they could go into.

Mr. Duerr suggested the personnel or the management of the plant as one of the most important features.

Mr. Johnson, speaking about costs, said that their brick was costing them close to $5.00 with coal at $4.25 per ton, sand 60 cents per yard, and lime 80 cents per barrel.

Mr. Hendricks thought their cost of manufacture was about $3.60, with lime at 40 cents, slack coal at $1.45.

Mr. Duerr estimated his cost as near as he could figure from short experience with a plant of 15,000 daily capacity, lime and sand $1.10, labor $1.75, fixed charges, $1.00, fuel and repairs, 50 cents. Total, $4.35.

President Squier: The Programme Committee has seen fit to assign me the topic, "Should Members of This Association Become Members of the National Brick Manufacturers' Association?" As I have never attended a meeting of the latter association, I have nothing to say on the subject.

P. L. Simpson: Mr. T. A. Randall, the Secretary of the National Association, who has been the business head of that organization ever since it was started, is present, and I think we might well hear from him on this subject.

President Squier: We will be pleased to hear from Mr. Randall.

Mr. T. A. Randall: I have no doubt at all, gentlemen, but that if those of you who can will attend the next National Convention, to be held at Birmingham, Ala., January 30th to February 11th, you will find it both a very pleasant and profitable experience. The right hand of fellowship will be extended to you, if you come as brick manufacturers. The fact that you are making sand-lime brick will not lessen one whit the cordiality of the welcome that will be extended to you. Of course, there are those among the members of the National Association who look askance at the sand-lime brick. Doubting Thomases they may be, but they are broad-minded, and open to conviction. If you will come, meet with us, give our members the benefit of your knowledge and experience, it will help brush away the cobwebs which now obstruct their vision on the subject of sand-lime brick. There is much in common between you and the old-line manufacturers. A brick is a brick, always, and if you can convince our doubting Thomases that sand-lime brick is a worthy competitor of the old time-tried and fire-tested clay product, there will be less friction, and competition will be more rational. With the sand-lime brick a proven success, there is scarcely a brickmaker in the land but would rather see a building constructed of sand-lime brick than of wood. Of course, you have got to meet competition, and competition means strife. Every manufacturer knows that friendly competition is less hurtful than the other sort. The National Association has done much to make friends of competing manufacturers. For these and other reasons, I am quite confident, it will pay you as individuals to attend the National Convention if you can. On behalf of the National Association, I extend to you each and every one a cordial invitation to attend our coming convention. (Applause.)

Mr. de Joannis obtained the floor and spoke in a contentious spirit, and attempted to ridicule the idea that a brick is a brick, saying you might as well say that a horse is a hare. Evidently he has never heard the ancient conundrum, "When is a brick not a brick?" Answer: "When it is a bat."

President Squier: The next on the formal programme is the query, "What are the brick and other trade journals going to do for the sand-lime brick industry?" which is assigned to Mr. Randall.

Mr. Randall: I am inclined to think that the gentlemen who were preparing this programme yesterday underrated the argumentative capacity of those present. They feared they were going to run out of material. Otherwise, this topic would probably not have been included on the programme. The trade journal, if it is worthy of the name, is an educator, and its mission is to promote the interest of whatever industry it represents, and give publicity to both sides of every debatable question bearing upon that industry. The spirit of trade journalism is the same as that voiced by President Roosevelt recently, when he said it was his intention to see that every man should have a fair chance. It is the spirit of fair play, and the clay journals have been actuated by that spirit in dealing with the sand-lime proposition in the past, and that they will continue along the same line in the future there is no reason to doubt.

There were some minor matters discussed in a general way, and the time and place for holding the next convention was considered, but no definite action was taken. Vice-President Doan did considerable missionary work in the interest of Denver, and secured a number of pledges in favor of meeting there a year hence.

On motion the convention adjourned, subject to the call of the Executive Committee.

THOSE IN ATTENDANCE.

Robert E. Dolan, the Silicate Brick Company, Denver, Col.
H. O. Duerr, Diamond Stone Brick Company, Wilmington, Del.
Frank S. Bond, DeLand, Fla., Bond Sandstone Brick Company, Lake Helen, Fla.
Harry De Joannis, Chicago, Ill.
P. L. Simpson, National Brick Machine Company, Chicago, Ill.
J. J. Moroney, American Sand-Lime Brick Company, Chicago, Ill.
M. A. Hays, Southern R. R., Chicago, Ill.
George H. Hartwell, Chicago, Ill
H. C. Schlegel, Daleville, Ind.
E. T. Slider, New Albany Wallplaster Company, New Albany, Ind.
James J. Davis, Elwood, Ind., Lafayette Brick and Lime Company, Lafayette, Ind.
W. N. Durbin, Wm. Venneman, Anderson Foundry and Machine Works, Anderson, Ind.
T. A. Randall, Indianapolis, Ind.
William King, King-Crown Plaster Company, Cedar Rapids, Ia.
E. H. Defebaugh, S. V. Peppel, Rock Products, Louisville, Ky.
J. McDiarmid, Brandon Brick and Lime Company, Brandon, Manitoba.
John L. Jackson, Saginaw Sand-Stone Company, Saginaw, Mich.
G. W. Straight, Holland Brick Company, Holland, Mich.
J. F. Scott, Hastings Presed Brick Company, Saginaw, Mich.
J. S. Palmer, Sebawaing Sandstone Company, Sebawaing, Mich.
George N. Dean, Jackson Pressed Brick Company, Jackson, Mich.
S. T. Hendricks, Sibley Brick Company, Sibley, Mich.
J. H. Hoskins, Ross-Keller Triple Pressure Brick Machinery Company, St. Louis, Mo.
S. J. Scott, Sharpe Sand Brick Company, Harrison Building, Columbus, O.
Arnold-Creager Co., Cincinnati, O.
S. A. Williams, Jr., Atlas Car and Manufacturing Company, Cleveland, O.
Samuel Wright, Atlas Car and Manufacturing Company, Cleveland, O.
Chas. W. Hopper, C. H. & D. R. R., Cincinnati, O.
George A. Cheney, the Marion Steam Shovel Company, Marion, O.
L. W. Penfield, American Clay Working Machinery Company, Willoughby, O.
J. W. Milholland,, L. Reeber, L. F. Smith, J. A. Warrick, Milholland Pressed Brick Company, Marion, O.
E. N. Robinson, Robert Whealy, American Cement Press Brick Company, Cincinati, O.
J. M. Broucher, the Brownell Company, Dayton, O.
W. A. Eudaly, Cincinnati, O.
P. P. Tafel, Semisteel Company, Cleveland, O.
L. S. Anderson, General Sand-Lime Brick Company, Geneva, Pa.
A. J. Johnson, Sioux Falls Pressed Brick Company, Sioux Falls, S. D.
Bolton Smith, Tennessee Granite Brick Company, Memphis, Tenn.
W. J. Carmichael, Wellsburg, W. Va.
W. K. Squier, Paragon Plaster Company, Syracuse, N. Y.
H. O. Keener, H. Huennekes Company, New York.
George W. Balkwill, Semisteel Company, Cleveland, O.

PENNSYLVANIA SHORT LINE.

Improved Service to Chicago and Louisville.

Effective November 27, new cafe cars, serving meals a la carte, were placed in service in train No. 19, leaving Indianapolis at 11:35 a. m., and arriving at Chicago at 5:30 p. m., and No. 18, leaving Indianapolis at 3:55 p. m. and arriving at Louisville at 7:10 p. m., superceding the present buffet service. These cars are thoroughly modern. The dining room occupies half the car and accommodates eighteen at a time. Snowy linen, decorated china, fine silver and cut glass are features of the elegant service. A library smoking-room adjoins the dining-room and contains big, roomy arm chairs upholstered in leather. A library consisting of select books is provided for the free use of passengers. The windows are extra large, the kind especially adapted for observation. For tickets, time of trains, connections, etc., call on ticket agent or address

W. W. RICHARDSON,
A. G. P. A., Indianapolis.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

How Would Sheet Asbestos Do?

Editor CLAY-WORKER:

Will you kindly give us the address of manufacturers of fireproof kiln covering. We want some kind of covering to spread on top of kiln after we are through firing, to hold the heat in.

R. S. O'NEAL.

A Burner's Suggestion.

Editor CLAY-WORKER:

I take it that Mr. O'Neal refers to common up-draft kilns, and would therefore advise him to close the platting on top of the kiln as tight as he can make it, and then at the last stage of the burn, spread hard coal screenings over it, and sweep them into the openings with a wire broom. This will make the top of the kiln perfectly tight. Daub up the arches, if burning with wood, and the furnaces, if burning with coal, perfectly tight so that no air can pull through the arches. This will help considerably.

There is a scheme of covering the platten with raw clay, which works admirably in many cases. The method is fully described by Mr. Crary in his book entitled "Brickmaking and Burning."

ALFRED YATES.

Wants a Moderate Cost Dryer.

Editor CLAY-WORKER:

Enclosed herewith find remittance to cover the cost of one copy of "Bricklaying," and for a year's subscription to THE CLAY-WORKER. I have been so busy the past two months that I could not keep track of myself. I have made two kilns of brick that are of a much finer quality than has ever been produced in this vicinity by anyone, and have a fine outlook for next year. I want to put in some kind of drying system that will permit me to work through stormy weather and to begin earlier, if I can think out some plan that will be within reach of my circumstances.

E. L. DEXTER,

Dayton, Washington.

Promises Something New in Brick Machinery.

Editor CLAY-WORKER:

Enclosed find money order for my subscription to THE CLAY-WORKER for the time ending August, 1905. There are two brickyards here doing business. Each have out-door rack and pallet system (soft mud), and each have a Barron dryer of 25,000 capacity, stiff mud. The market is fairly good, mostly shipped by rail. Common brick is all that is made. The old firm of Piper & Co. has been reorganized and is now the Piper Brick and Tile Company, Limited, capital stock $40,000. William Piper and F. E. Piper are the managers. The Red Deer Lumber and Brick Company, Limited, capital $50,000, carries on a lumber business in connection with its brick business. R. C. Brumpton is general manager.

You may hear from me soon in connection with a new machine I have gotten out, and which will be something new for the brickmaker as well as machine manufacturers. I have sold to all near-by yards from the model. I have had a rough machine working this fall.

FRANK PIPER.

Alta, Can., November 23.

Written for THE CLAY-WORKER.

WHAT IS A MASTERPIECE?

We notice that someone seems to feel hurt on account of a sincere expression of appreciation which appeared in your issue of October and which we wish to state was entirely unsolicited by us. The gentleman in question, who signs himself: "Technical Ceramist but no Idealist," seems to feel that we have been praised where we should have been condemned. I wish to answer this criticism of our work. First, his objection to the word "Masterpiece". He says: "A masterpiece must be executed to be a master in every respect and it certainly cannot be said that the 'Sun Worshippers,' as such is a master in the technical end of the execution." The Century Dictionary defines "Masterpiece" as follows: "Any performance or production superior to others of its kind whether by the same person or by others."

We claim that this piece is a masterpiece for this reason, that it is the first piece of its kind that has ever been made since the work of Della Robbia in Italy about the 16th century that it is the first original piece done strictly after the Della Robbian school on which present-day dull finish glazes have been applied. Therefore, even if the glaze is not perfect, even if the mantel is not as fine as will be made by us and others later on, it being the first of its kind is superior to others and expressing so well, as it does, the artistic theme which was to be expressed, we claim that it is a masterpiece.

Our critic says that our glazes are crazed and that salts have appeared on the surface. This we do not deny, but we wish to state that as far as we have been able to learn, there is only one concern in this country, who, at the present time makes faience and tile which does not craze or show salts on the surface under certain conditions. Even the largest and best manufacturers in this country will not give a written guarantee on their tile not crazing. In this particular instance the craze does not injure or interfere in any way with the artistic effect, but rather adds to it in the two green panels which appear on either side of the opening, giving them an antique, veined appearance which was what the artist wanted. Therefore, we do not care, neither should the critic, because this work must be judged from the artistic standpoint above all else rather than from the technical execution.

The same thing applies to the matter of salts on the glaze, for the writer looked very carefully through all of the exhibits at the fair and he found this same fault was present in almost every case. Even in the German exhibit, which country our critic holds up as being the best and which statement we do not deny, even in the German exhibit, the writer found tile where this same defect was present.

We furthermore wish to call attention to the fact that under our booth in the Mines Building was between three and four feet of water which conditions our critic possibly was not cognizant of. The writer does not bring this up as an excuse; nevertheless, we believe that in a dry, warm place the salts would not have been as apparent.

Our critic denies the statement made by your correspondent that European potteries never attempted such work, which goes to show that he is more idealistic than ceramist and not at all familiar with the terra-cotta industry abroad. "In mat finish, or even crystaline glazes, the French and German are ahead of this country." It seems to us that this is rather off the subject as there is no question as to the fact that France and Germany are ahead of this country in every line of ceramics, but we believe that your correspondent's statement stands true, that European potteries have never attempted such a work.

We will be very grateful to our critic if he will tell us of any instance where any factory either abroad or in this country has taken an original theme and worked it out after the old Della Robbian school and applied mat finishes. We know that there has been conventional work done; know that there have been copies of the original Della Robbian work done; we know that there has been relief work in the porcelaine and pottery works of both France and Germany, but this is all beside the mark and the statement still remains to be disproved that this is the first piece of work done from an original theme after the Della Robbian spirit, using high relief and practically the same body as Della Robbia used, the same methods in cutting up and joining the pieces and applying mat glazes. Therefore, if this is the first piece after such a lapse of time since the Della Robbian school, even if it is not perfect in technical details, why in the present day, is not a masterpiece?

There is no question but that the correspondent for THE CLAY WORKER, who wrote the article and whose name we are as ignorant of as our critic, was truly impressed with the spirit of the work and therefore has shown his artistic temperament since he has caught the true artistic feeling in the piece. He has indeed felt the whole atmosphere of the panel when he compares it to the "Angelus."

In closing, we simply wish to say that a man who signs himself "a technical ceramist but no idealist" should not set himself up to judge an artistic production, for no man can be truly artistic or have any true artistic sympathies unless he has something idealistic in his makeup. Any true artist will tell you that idealism goes a long way in the appreciation of true art.

The mantel was made up to be the most artistic clay mantel ever produced in this country and that we believe it is, despite the faulty technical details which have been referred to above. Thanking you for allowing us to state our position in this matter, as we fear the critic had an idea the article was written at our instigation.

THE HARTFORD FAIENCE CO.,
E. W. Robinson, Manager.

THE CRITIC'S CRITICISM CRITICISED.

EDITOR CLAYWORKER:

The remonstrance in your December number from "'A Technical Ceramist" about the *Sun Worshippers*, or the magnificent Faience Mantel exhibited by the Hartford Faience Co., seems to the writer to be inspired by the fear that it might capture a Grand prize, rather than from its ceramic merits. It is quite true, as he states, that this bold relief study in Matte Glaze colors has overstepped the narrow line that is involved in the Matte Glaze problem of efflorescence. For the risk of efflorescence on Matte Glazes is nearly as formidable a problem as crazing in high glaze work, or is seen too frequently to be flattering, and even on the products of some of our most noted potteries. While it is indeed unfortunate that the efflorescence is present, the extreme dampness of the building in which it was exhibited may be largely responsible for it. Whether the makers of this fine piece of work were aware of this defect is quite doubtful, and certainly they were not aware that it would stand immediately over an old lake which is said to underlie the entire Mining Building. It is also quite likely that the makers did not have an opportunity to select this mantel from a dozen or more samples, like the Art Potter, as it was a special production gotten up at the last moment. It is also true that there is an insignificant amount of crazing, but what exhibit of tile at the Exposition was entirely free from this defect?

The "Sun Worsippers" cannot, therefore, claim to be perfect in all the requirements of ceramics, but it presents such an unusual amount of merit, it is such a bold, original undertaking, and its general effect is so very succcessful as to entitle it as a masterpiece in ceramics. For inception, the composition of the study, the softness and appropriateness of the color scheme and the unusual success in the bold relief, aside from the artistic execution, fully warant the term of masterpiece being applied to the "Sun Worshippers" as a work in ceramics. The four elements of beauty in ceramic production depend upon outline or design, color, the drawing or decoration, and relief. These first three factors are very successfully utilized by several of our Art Potters, but the last, or relief, has not met with such marked success, and by the means of relief are the finest and highest color effects obtained, as well as the strength and boldness coincident with light and shadow. This is not only where our American potteries usually fail, but even the best of the European potteries seldom successfully surmount this difficult obstacle. For marked difference in elevation as in high relief invites disaster to the color scheme by causing the glaze to run off the high points, with the grave results of insufficient glaze or colors in the former case and to great depth in the latter. The great ceramic success of the "Sun Worshippers" is due and mainly relies upon the successful application of high relief, which in this case has been a marked success.

While "Technical Ceramist" can undoubtedly point to plenty of European productions that are successful as mere Matte Glaze propositions, the writer would like to know where such work as the "Sun Worshippers" is being made in Europe? The writer fears that the kick originates from the narrow view of the purely technical result of a Matte Glaze and, therefore, cannot forgive the unfortunate defect in overstepping the narrow boundary line of not eliminating efflorescence. To calmly study this beautiful production and observe what an enormous advance it is over the usual production of our American potteries certainly warrants all the enthusiasm expressed in the November number of THE CLAY WORKER, and the production is entitled to all the encouragement that every lover of fine ceramic work can contribute. Such strong work so effectively carried out is worthy of the warmest admiration, even though it presents the evidence of having been made by mortals and, therefore, has not attained perfection.

A SUN WORSHIPPER.

WILL RUN ALL WINTER.

After a season of more than usual activity, the Saginaw (Mich.) Paving Brick Company is preparing for an active winter, and President John H. Qualmann advises us that the brickmaking plant will have to be run all winter, in order to stock up, a piece of news which will be of special interest to employes. This company has recently installed several improvements to the Saginaw plant, including another dry pan, used in grinding clay, and also four new kilns. There improvements will add greatly to the capacity of the already extensive plant.

At the Flushing clay mine which belongs to the company, and which is one of the most valuable properties in the state, a new steam shovel is being erected to facilitate the work of handling the clay.

TO MINE "BLACK DIAMONDS."

We wish to call attention to the advertisement of the Kentucky Coal Company, in this issue of THE CLAY-WORKER. The company has one of the best propositions in the market to-day, and the officers and directors are men of integrity, commercial ability and good business standing, with plenty of energy and vim; who understand the coal mining business thoroughly, one of the officers having recently put down and equipped a mine in the same field where they have their holdings.

We all know there have been large fortunes made in coal mining. Many of the millionaires of today have made their money in the coal business. Here is an opportunity to use your foresight. The holdings of this company are well located, being on the Illinois Central Railroad and in close proximity to the Ohio River, giving shipping facilities not to be surpassed in any district. In using the river, coal can be marketed at New Orleans at a much less price than by rail, and this point is one of the great coaling ports in America.

Union County, Kentucky, has now several large coal mines. The Trade Water Coal Company, at Sturgis, and the U. S. Coal and Coke Company, of the same place, each of 1,000 tons capacity a day; the Ohio Valley Coal and Mining Company, at DeKoven, with 1,000 tons capacity daily. The great St. Bernard and Reineke mines are in this field, and it is only a question of time when the Kentucky Coal Company will have a capacity of 2,000 tons daily. We wish the Kentucky Coal Company success, and hope they will accomplish their undertakings in much less time than they anticipate.

Written for THE CLAY-WORKER.

ST. LOUIS BRICK AND BUILDING NEWS.

BUSINESS with the brick and terra cotta people has been improving right along since the World's Fair closed.

Plans for new factory and commercial buildings are receiving the attention of many architects just now, and everything points to a greater amount of this class of building for the coming season than in several years. Business is picking up. The new year will find plans matured for the erection of several handsome commercial buildings in the down-town districts. A number of the large manufacturing firms that have for some time felt the necessity of increasing their space to handle a fast-growing business are contemplating substantial improvements, and the work from this source will add materially to the increase in building next year.

The St. Louis Coffin Company intend to erect at an early date an eight-story brick building to their factories at Eighteenth street and Chouteau avenue. The new building will be on ground immediately west of the present building, and will be devoted exclusively to the manufacture of hearses. The plant will have a capacity of 400 hearses per year and will give employment to about 350 men.

Among other factory buildings for which plans have been made is an eight-story structure for the Hamilton-Brown Shoe Company at the northeast corner of Twenty-first and Locust streets, and buildings for the Crundon-Martin Woodenware Company at Second and Gratiot streets.

The building committee of the Kinloch Telephone Company, of which August Busch is chairman, has ordered the buildings at the northwest corner of Tenth and Locust streets vacated at once and wrecked to make way for their new building there.

A modern fireproof structure of eight stories will be built at a cost of $300,000. The telephone company will occupy the four upper floors of the building, and negotiations are now under way to lease the remaining space to various firms. The building will be ready within a year.

Another project is a large building at the northwest corner of Seventh and Pine streets. It is barely possible that the building will be occupied by the Western Union Telegraph Company.

The building business of November was good, in comparison with that of the corresponding month of last year, as is shown by the permits issued for the erection of new buildings, their aggregate value being double that for which permits were issued in November, 1903. The comparisons are as follows:

NOVEMBER, 1904.

	Number.	Value.
Brick buildings	168	$1,169,107
Frame buildings	241	575,546
Additions, etc.	125	258,628
Totals	534	$2,003,281

NOVEMBER, 1903.

	Number.	Value.
Brick buildings	82	$ 368,559
Frame buildings	174	183,679
Additions, etc.	140	166,776
Totals	396	$ 719,014

This shows an increase of over a million and a quarter dollars. It represents mostly medium-sized buildings, no skyscrapers being in the list, though several are planned.

Much gratification is expressed in real estate and building circles by the fine showing made by St. Louis after its Fair, for it silences those croakers who predicted that St. Louis would suffer from the reaction incident to the previous year's prosperity. The figures are indisputable proof that St. Louis is underbuilt and its advantages for investment would be appreciated more than ever after the Fair. It has been compared with other cities and found wanting—in business and residential buildings enough to house those who wanted them.

It will keep an army of men busy and will help to house the thousands who are in St. Louis looking for residential quarters. It is fair to say that all of these homes will be occupied immediately on erection, removing the tension that now exists for lack of houses.

Never has there been such a demand for choice West End ground for improvement, for desirable homes and for good investment West End and down-town properties. Out in the West End, where during the summer there was little activity in building, on account of the high prices of material and labor, to-day there is a scene of activity which only a stranger in riding through the district can easily perceive.

Almost every block in the West End and southwest parts of the city has new buildings in process of construction. Hundreds of homes, flats, apartment buildings and business blocks are being erected. It is a wonderful growth, which demonstrates the vast benefit St. Louis has derived from the Exposition. It means that the city has increased in population and strangers who have come to stay, and with all these newly completed buildings there is just as much a scarcity for desirable dwellings as there was in the spring.

In the down-town district there has been a large number of purchases made within the last sixty days. Nearly all of the available down-town properties that have been for sale within the last year have been disposed of either by direct purchase or lease, until to-day there is absolutely a scarcity of down-town property on the market for sale. A SAINT.

ILLINOIS CONVENTION PROGRAMME.

Twenty-Second Annual Programme to be Held at Champaign January 10 and 11, 1905.

Tuesday, January 10, 10:00 A. M.

Convention Called to Order.
Enrollment of Members.
Appointment of Committees.

Afternoon Session, 1:30 P. M.

Address of Welcome by Hon. E. S. Swigart, Mayor of Champaign.

Annual Address, President F. W. Butterworth, Danville.

"The Operating of Brick Plants by Electricity," by S. H. Alsip, Belleville, Ill.

"Drainage Suggestions for the Tile Manufacturer," Fred R. Crane, Dept. of Agronomy and Chemistry, University of Illinois, Champaign.

"The Selection and Care of Machinery," Davis Brown and Charles Burridge, Tecumseh, Mich.

"Paving Brick, Testing and Inspection," A. N. Talbot, Prof. of Municipal and Sanitary Engineering, in Charge of Theoretical and Applied Mechanics, University of Illinois, Urbana.

"A Comparative Study of Sand-Lime Brick and Clay Brick," H. B. Fox, Instructor in Geology, University of Illinois, Urbana, Ill.

"The Labor Question," General Discussion by Members.

Banquet at 8 P. M.

Wednesday, January 11th, 9:00 A. M.

"Concrete vs. Brick," Will P. Blair, Terre Haute, Ind.

"Shall the University Establish a Clay Laboratory, Inaugurate an Investigation of the Clay Resources of Illinois and Offer a Course of Ceramic Engineering?" Prof. C. W. Rolfe, Urbana, Ill.

"The Evolution of the Face Brick," R. W. Combs, Chicago, Ill.

"The Manufacture of Sewer Pipe," H. C. Morrow, Whitehall, Ill.

"The Economical Construction of a Brick Plant," George E. Luce, Harrison Park, Ill.

"Joint Fillers for Brick Pavements," I. O. Baker, Prof. of Civil Engineering University of Illinois, Urbana, Ill.

Question Box Opened, Read and Discussed.
Report of Treasurer.
Report of Committees.
Report of Bills Against the Association.
Election of Officers.

Wednesday, 2:00 P. M.

A trip to the University of Illinois at Urbana.

Headquarters of the Association will be at the Beardsley Hotel, which has just been enlarged and refitted. Rates, $2.00, $2.50 and $3.00 per day. F. W. BUTTERWORTH, President.

GEORGE H. HARTWELL, Secretary, Danville, Ill.
303 Dearborn St., Chicago, Ill.

OFFICIAL ANNOUNCEMENT.

The Nineteenth Annual Convention of the National Brick Manufacturers' Association and the Seventh Yearly Meeting of the American Ceramic Society, to be held at Birmingham, Ala., January 30th to February 11th, 1905.

THE EARNEST "call" from the Southland has been heard and heeded, and while due consideration has been given the claims of other cities, from which similar invitations were received, the home of Treasurer Sibley is easily the first choice for our 1905 convention. We have been influenced not a little in this decision by the accessibility of Birmingham. Located on the great Trunk lines of the South, it can be reached by fast through trains from almost every section of the country, and while situated far enough south to insure mild weather, and out-door pleasures, it is not so far south as to be difficult to reach, even for those whose time is limited.

Birmingham is but a night's ride from Cincinnati, and so may be easily and quickly reached by the large number of our members residing in the Central States. It may also be reached with almost equal facility by our eastern members, who can make direct connections via Washington. While the western members will have the advantage of through trains direct from the principal cities of Texas and the States lying north of the latter and west of the Mississippi river.

The get-at-able-ness of Birmingham will appeal to all of those who feel that they can spare but a few days from home at that season, and to those who can arrange for an absence of a couple of weeks or more, it will appeal irresistibly, for a series of most delightful side trips to points further south, such as New Orleans, Mobile, Tampa, Jacksonville, and other Florida points, may be planned. Those going via Cincinnati will be afforded an opportunity of stopping off at Chattanooga, where they can visit Lookout Mountain and the famous battlefields of that section, which are now reached by trolley car from Chattanooga.

Birmingham is a beautiful and thoroughly up-to-date southern city, and with her suburbs now has a population of over 100,000 people, and affords unexcelled facilities for a successful convention, including a splendid modern hotel, the Hillman House, which will be headquarters during the convention, and an ample convention hall and exhibition room for the display of brickmaking machinery, etc.

There are all kinds of brickmaking plants in the vicinity of Birmingham, all of which, it is anticipated, will be in operation, thus affording delegates an opportunity of fully investigating the *modus operandi* of the various factories, which include up-to-date soft clay, stiff clay, dry press and sand-lime processes; also a large sewer pipe plant and extensive chemical and metallurgical establishments, the doors of which will be thrown open to our members.

REDUCED RAILROAD RATES.

The Southeastern Passenger Association has authorized reduced rates to the convention on the basis of one and one-third fare on the certificate plan, or a two-thirds rate for the round trip, such as the Association has enjoyed in years past. It is anticipated that all the other passenger associations will concur in this action, and the reduced rates will be obtained from all sections of the country. It is also planned to have special rates to points further south for those who want to make the side trips. Return tickets will be good until midnight of Wednesday, February 15. A special trip is contemplated to New Orleans, for which it is hoped a still lower rate will be obtained. Further particulars in this connection will be announced subsequently. Those desiring information relative to requisite of membership, etc., are requested to communicate with the Secretary, at Indianapolis.

THE EXECUTIVE COMMITTEE,
W. S. Purington, *President.*
Theodore A. Randall, *Secretary.*

A BEAUTIFUL WORLD'S FAIR SOUVENIR PRESENTED TO THE N. B. M. A. BY ST. LOUIS CLAYWORKERS.

There was received recently at the office of the Secretary of the National Brick Manufacturers' Association, a beautiful silk American flag and standard, and with it came the following letter, from Prof. H. A. Wheeler, Secretary and Treasurer of the St. Louis Committee on Entertainment:

"The Reception Committee of the St. Louis meeting of the N. B. M. A., desires to commemorate the honor bestowed upon them by the National Association in holding a special Exposition meeting, and so present you, for the Association, with a beautiful silk American Flag. The committee regards 'Old Glory' as the most suitable emblem, for around it may rally future special and regular meetings. We have taken the liberty of inscribing the name and date of the St. Louis meeting on the top bar of the flag, and hope that this custom of inscribing the name of each meeting place on the flag will be followed in the future. This will make the flag a happy historic record, around which to gather the names, memories and sentiments of the past meetings. The flag and stand have been carefully encased in a double duck and leather casing, so that it is completely protected for shipment to the different meetings. We the committee trust that this beautiful flag will give as much pleasure in rallying the members to future meetings as it did the St. Louis members to entertain them at the St. Louis World's Fair in 1904."

The gift is indeed a beautiful one, and the sentiment which accompanied it does honor to both the generosity and patriotism of the donors, whose wishes will be observed and the flag be made the standard about which members may gather at future meetings. We are always glad to take our hat off to "Old Glory," and in the future, when we look upon this, the Association's banner, we shall also feel like doffing our tile to the St. Louis Committee.

Written for THE CLAY-WORKER.

CHICAGO BRICK AND BUILDING NEWS.

A BETTER RECORD than has been made in the world of building materials in Chicago during the twelve months just closing would be hard to find. Even the close-mouthed old fellow who invariably tells you that "it's awful dull; nothing doing—labor troubles—money terribly tight," and all that, and paints a picture of melancholy that would make Jocundus himself turn down the corners of his mouth, has to admit that it has been a "pretty fair year, after all," and that the outlook "isn't half so bad as it might be."

As has been indicated in the Chicago news from month to month, building of all kinds has flourished here. In the downtown district the activity has been especially noticeable and noteworthy. New skyscrapers have taken the places of old landmarks of antiquated type, and each addition to the number of buildings has been an addition to the architectural beauty of the city. The latest building to near completion is the Chicago Orchestra building in Michigan avenue, just north of the handsome Railway Exchange building, completed earlier in the year, an illustrated account of which was published in THE CLAY-WORKER. Large apartment buildings have been put up in all parts of the city during the past months, in addition to more than the usual number of fine residences and dwellings of the more modest type. Prices in material have been fair and remained steady for the year, with the exception of common brick, which has been unusually high, selling in the city at the close of the year for $8, cash $7.20.

Brick pavement continues to increase in favor in and about Chicago. The Purington Paving Block Company are just completing a job of five blocks, from Eighty-seventh street to Ninety-second street, in South Chicago. It was a great job and called for about 470,000 blocks. Another job in Evanston requiring about 250,000 blocks is under way.

Charles A. Bonner, who was dangerously ill during the summer, is now convalescent at Asheville, N. C., and is expected to be able to resume his duties the first of the year. SCRIPT.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

THE FINISHING UP of the brickmaking season is being pushed as fast as possible, and for two causes. One reason, and the one which concerns the boss financially, as many in the business have found out in times past, and as others who will engage in the manufacture of brick will learn, that the cost of the work done after molding has been stopped, till the last kiln is burned, adds a very large item to the cost for the season's output.

The amount of work done for a day's pay at this time is far below any other time during the season. When a yard is in full swing during good summer weather, and a full gang is working long enough to keep the work up, the man who has just started to make brick may sit under the shed on a pile of battens, get out his pencil, knowing the wages paid, he counts the number of men and he is surprised at the low cost of making brick at that time. A still greater surprise comes to him before the season is at an end. Some rainy day, having nothing to do, he has a look over his books, and foots the money-paid-out column. Then does the same with green brick turned out, and finds that the summer days cost making had crept up in cost, and why? If he has kept a correct account of all work done, and charged the cost of men that had put in a pit of brick when it was too wet to mould, he will be very much surprised at the increase in the apparently low figure his summer dream showed him.

A VAST CHANGE

Is plainly seen on the yards in the last fifteen years. In years gone by, at the end of the season, when men were plenty, there would be about two kilns to be burned after the last whistle blew, and both would be kept open so that it would be handy to the wheelers, as the one they expected to burn first would be closed, and if not walled and daubed a gang would be put on it to get it ready. On some yards a kiln would probably be all ready and would be set fire, which would leave but one to be burned. At that time wood was the fuel, and each yard was doing its best to get wood so that they could get the kiln burned while there were men around to do it. As for the last kiln, it would stand for a while till the wood was on the switch.

Of late years labor has been so scarce that some of the yards have had to let their kilns stand, for if they burned them they would not turn out green brick, which was of more importance, so that for several seasons there have been generally three kilns, and in some cases four kilns, after the making season was over, that had to be burned before they were all through. It is no pleasant job to be around a brickyard the last of November or during December. Hands are done up in rags to protect them from the cold and the coal dust, with its sharp edges cutting wherever they touch, making life miserable.

CONDITIONS OF TRADE

Have caused great changes. Years back, when green brick were piled under the shed, so that they could be set uniformly dry and the thoughtful boss wanted to give work to his men, not taking into consideration the cost to himself, steam could be seen coming from burning kilns in January. Those were the days that you hear the old men tell about, that they made nine months of the year, the extra time around the kilns or work done outside of the regular days filling in the broken time. To-day scarcely five full months are made, and conditions of trade have in the last ten years caused some very short seasons. To start in April, but generally May 1st, and to have all brick set in and burned by the 1st of August is short enough. And the trade conditions of 1904 are the cause of the brickyards molding later than good judgment would call for, always hoping that it would clear off warm, although the green brick were often frozen solid. For several days, however, they kept right at it, till after the middle of November, and it will be the first week of December, if not later, before the last kiln is out.

MAKING OF BRICK

On tidewater has of late years become one of much worry to the boss as regards the most essential thing in the business, and that is labor. If at any time a full gang should be at work, it is not to be counted on for any length of time. The past season there has been more extra work done than in any other season. The work was there for them to do, and it seems that some bosses do not think a man gets tired, but is like a machine—just furnish the steam and it will run right along. When a man does what he is assigned to do for a day's work, and he works, as the saying is, "like a horse," it does not go but that the man is tired. A man might work overtime one or two days a week, but to expect a man to do it day after day is looking for more than one can stand. The argument used by one of the bosses when he asked a man to work overtime, and he refused. The boss said to him: "Don't I pay you for doing it?" The man's reply was: "I am willing to do extra work once in a while to help you out, but if you expect me to do it all the time I will leave," which he did. He was a married man and made all the time he could; was always there in the morning to go to work unless sick—one of the very scarce men found working on the brickyards of to-day.

THE MARKET

Takes all stock that is going in, and as the 1st of December is near, and the up-river yards will soon close down, unless there should be a style of weather which has never before put in an appearance in this part of the land, the amount of stock left on the yards this year will be somewhat short, as there has been a steady call for brick, and there has been no hold-back, only when the labor was so scarce that it would take several days to load a barge. The rates range from $7 to $7.50, according to quality.

A. N. Oldtimer.

A BIG YEAR AT GALESBURG.

The closing year has been a record-breaker with the Purington Paving Brick Co., Galesburg, Ill. They have manufactured and shipped something over 75,000,000 paving brick and block. This is a handsome increase over the output of any previous year. Notwithstanding this immense volume of business, and the fact that there is at present no let-up whatever, Mr. W. S. Purington, the vice president and general manager of the company, will be able to spare the time for a trip to the National Convention at Birmingham.

CONVENTION DATES.

The Illinois Clayworkers' Association will hold its twenty-seventh annual convention at Champaign, Ill., January 10th and 11th, 1905. President, Frank W. Butterworth, Danville, Ill.; Secretary, George H. Hartwell, Chicago, Ill.

The Iowa Brick and Tile Association will hold its twenty-fifth annual meeting at Ottumwa, Iowa, January 18th and 19th, 1905. President, J. L. Raney, Fairfield, Iowa; Secretary, L. W. Denison, Mason City, Iowa.

The seventh annual meeting of the American Ceramic Society will be held in Birmingham, Ala., January 30th, 31st and February 1st, 1905. President, F. W. Walker, Beaver Falls, Pa.; Secretary, Prof. Edward Orton, Jr., Columbus, Ohio.

The Nineteenth annual convention of the National Brick Manufacturers' Association will be held at Birmingham, Ala., January 31st to February 4th, 1905. Tickets will be good returning until February 17th, the second week being devoted to side trips farther South. President, W. S. Purington, Galesburg, Ill.; Secretary, T. A. Randall, Indianapolis, Ind.

The Wisconsin Clayworkers' Association will hold its fifth annual convention at Manitowoc, Wis., February 23rd and 24th, 1905.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

TWENTY-FIRST YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

227-233 East Ohio St.] T. A. RANDALL & CO., Indianapolis.

VOL. XLII. DECEMBER, 1904. No. 6.

CURRENT COMMENT.

We earnestly wish every reader of The Clayworker a Merry Christmas and a Happy New Year.

* * *

One of the best Christmas gifts of all is good cheer, and no man is too poor to give that if he has a mind to.

* * *

Our extinguished co-temporary to the contrary, notwithstanding, a brick is always a brick, except only when it is a bat.

* * *

Reciprocity don't mean that the other fellow shall always do something for you. It takes two to play the game, and both have to do their part.

* * *

If Christmas didn't come around once in a while some of us might forget that it is part of our duty on earth to feel kindly toward our fellow men.

* * *

The twenty-second anniversary issue of THE CLAYWORKER will be an exceptionally valuable magazine, one that should find a place in the library of every clayworker in the land.

* * *

It is all right to remember your customers when Christmas time comes, but you should also remember that the customer is not to be bought, nor sold, if he is worthy of attention at such times.

* * *

Make among your New Year resolves one to have your office comfortable and inviting, for, when you stop to think of it, a man spends the majority part of his waking hours in his office, so why not have it comfortable?

* * *

Among the questions that might be taken up at the annual meeting to advantage is that of the increased cost of clay in the bank. The land values of the country have gone up quite sharply the past few years, so due attention should be given to the increased cost of clay banks.

* * *

When you go into winter quarters, don't forget that rust is harder on machinery than work, and that it is better and cheaper to take steps to prevent rust than to remove it next spring.

* * *

The man that can't find something to be thankful for has reached the point where he should be thankful that a kind providence has not brushed him out with the rest of the rubbish.

* * *

If any brick, tile or pottery manufacturer can look through this issue of THE CLAYWORKER and fail to realize that this one number is worth more than the price of a year's subscription, he has our sympathy. The January number will be even better.

* * *

When they want to point out that some other building material has merit, they try to make out that it is as good as brick, which is an admission of the quality of brick that ought to lead the user to stick to what is admitted as the standard of goodness.

* * *

Many a man will find out just how badly mistaken he has been in his calculations when the end of the year comes, and the way the cold figures at posting time eat into the expected balance is enough to be discouraging were it not for the hope we always have of doing better next year.

THE SAND-LIME BRICK CONVENTION.

We surmise that the report of the convention of the Sand-Lime Brick Manufacturers, given in full in this issue, will be read with fully as much interest by thousands of our readers who are not identified with that system as by the few who are, for it is quite manifest that every brickmaker, no matter by what process he may manufacture, is looking for information on the subject of sand-lime brick. There are several grains of comfort in the report for the old line, or clay-brick men. For instance, the item of cost seems to be considerably greater than the promoters have lead us to believe. The average cost seems to be close to $4.00 per thousand, and in some instances much higher. If this holds true generally there need be no fear of great trade demoralization as a result of the introduction of the sand-lime brick. Then, again, it is quite evident from the discussions that the new system, like the old, is fraught with many difficulties and uncertainties. The same thing seems to be true of sand as of clay: There are no two deposits just alike and a system that will work well in one location will not work at all in another. And so it goes on through the whole category of brickyard tribulations. The same high order of business ability is just as essential with the new as with the old method of manufacture. It is quite certain that not all who go into the business will succeed, and those who do will earn their success only by great industry, perseverance and skill.

THE PASSING OF THE OLD YEAR.

Looking back over the year that is drawing to a close, one can see some degree of disappointment in the light of early promises of stirring times unrealized, but, coming on down through the year there is in the midst of this disappointment at not getting the great business boom promised, a gradual picking up of business that has really made the year's business as a whole reasonably satisfactory from the brickmaker's standpoint. Later building operations, while they did not make up for all the slackness in the early spring, summed up in the aggregate a very satisfactory volume. Then, as some recompense, labor troubles were trimmed down considerably by the lack of urgent demand for help. There has been some trouble of this nature, of course, but nothing like there might have been had the activity promised at the first of the year been fully realized. In fact, it is an open question if the trade did not really fare better from the little early year slow-down of the prosperity wagon. Strikes in the building trade, or, rather, the spirit begetting them, had reached such an acute stage that had something not occurred to check it, it would soon have been a serious drag to prosperity itself.

THE EFFECT OF LABOR TROUBLES.

As we continue to look back at the work of past years, the fact comes home that the labor problem is not only a drag to the brickmaker's prosperity wagon, but it is also one that is practically beyond the reach or control of the craft, for it occurs mostly in the building trades, among the men who handle and lay the brick after they are made, a business with which the man that makes the brick has no connection further than the sale of his product and collecting the returns therefor. Moreover, there is no plain opening in sight that will let the average brick man through the gap between making and laying brick so that he can lend a hand toward mitigating this drag. Maybe some of the wise workers of the Association can devise some means of connecting the brickmakers' shoulders with the wheels of the building trade, so that they can lend a helping hand, and if so, it is a work worth doing, for it is the clogging of wheels in the building trade that generally hampers operations at the brickyard more than any other one thing.

SIGNS OF THE TIMES.

One of the features of the past year that is worthy of more than passing notice is the growing into more or less prominence of other hard building materials, offering in some measure competition to the clay brick. This is a subject worthy of study, as all new offerings in any commercial line are entitled to an audience and should then have success measured by merit, but there is nothing in it for apprehension, worry or contention. There is room for all and it adds the spice of variety. In other words, the demand for building material of the "hard" class is increasing at a greater rate than the variety is multiplying, and there is nothing in sight to indicate anything else but that the brick industry has plenty of room to grow from year to year, regardless of how many other kinds of building material may come along. The supply of lumber is growing so scarce and high in price that it is generally as cheap to build of brick as lumber, even though the laying of the brick is expensive, and this of itself means a gradual increase in the use of brick from year to year, an increase by the way, that could be materially augmented if the cost of laying brick in the wall could be reduced. Then, another factor is the growing human desire as the country gets older to build more substantially. The frame house idea, which was all right for the pioneer, as a fit successor to the log cabin, is giving away in its turn to the more durable structure of harder building material.

Along with this growing desire for better buildings in the country comes also an increased prosperity that furnishes the means to satisfy the desire, so that between the two the scarcity of lumber and the natural desire and ability to build more permanent structures, there is a very bright future ahead for hard building material. Of the hard building material, brick has always been and always will be the meat and body. There are other good building materials that, as above stated, add the spice of variety, which should be a source of pleasure instead of one of worry, for who is it that would not prefer his meat spiced?

GROWTH OF THE CLAY INDUSTRIES.

In a late publication of the U. S. Geological Survey, mention of which was made in these columns, there are a number of points of special interest aside from the steady progress being made. As stated before, the total value of clay products for 1903 is given as $130,962,648, as against $122,169,531 in 1902. Of this amount, the value of the brick clay itself is estimated in round numbers at $15,000,000, the same as in 1902, but an increase of $6,000,000 since 1898. There is nothing to tell us how much the value of the clay itself has increased, or whether or not the increased value is simply one of increased quantity. In fact, when we consider that the value of the clay is the same in 1903 as the year previous, while there is a decided increase in the value of the product, it begins to look as if quantity were considered on the same basis as years ago for value per ton. Now, in the light of this, the question for study is, how much has clay in the bank increased in value of recent years There is no room whatever for doubt about it having appreciated considerably, for land values of all kinds have been going up at an astonishing rate the past few years, partly from the natural increase in population and partly because of the prosperity that has come to the farming class.

In addition to the brick clay item, there is another in the chart classed as "Clay—all other than brick," which, in reality, is the figures on the production and sale of clay by those who are not brickmakers, and properly includes some clay that has gone into brick, especially fire brick. This list shows a total value of $2,649,042. This includes kaolin to the value of $356,380, fire clay to the amount of nearly half a million dollars, ball clay, stoneware clay, clay used for wall paper, plaster, boiler covering, paper clay, slip clay, brick clay other than that mined by brickmakers themselves, and all other uses for which clay is reported.

This does not include bauxite, however, which is listed separately with a value for 1903 of $171,306. This material, which is now coming into prominence as a base for the manufacture of alundum, a new artificial abrasive material that is said to be superior to corborundum, has done some peculiar stunts on the chart of statistics. Back in 1899 the production for the first time jumped above the hundred thousand mark, the figures for that year being $125,598. Then it went back considerably for a couple of years, not crossing the hundred thousand mark again till in 1902, when it went to $128,206. It will be seen from this that 1903 shows a very healthy growth, and it is likely that when the returns come in we will find that 1904 has done even better. For this new use, the manufacture of alundum out of it by the Norton Emery Wheel Company, at Niagara Falls, is just now reaching prominence. Meantime, too, the base of supply has shifted materially, and Georgia and Alabama, where it first came into prominence, have given away to Arkansas for first place in production.

To go back to the subject of kaolin for a moment, there is some matter to stimulate home industry in this line in the import figures for 1903, which show clay imported to a total value of $1,198,418, of which $898,573 is kaolin or china clay. This, it will be noted, is more than twice the value of the home product, or at least that part of it shown as mined and sold, aside from what might have been mined and worked direct without changing hands. Of course we can understand that part of this is due to the fact that a lot of the imported clay is of a quality not found in the market here. But that does not shut out the question, Is the clay here, and can it be brought to the market? Something of this same nature in regard to marble was once taken up direct with Dr. David T. Day, of the U. S. Geological Department, and the information gained was that every kind and color of marble known to commerce could be had on the American continent—it simply being a matter of development. Isn't this idea worth some investigation in the kaolin world?

One of the most pleasing things in connection with this report is the steady progress being made by vitrified paving brick. The increase in the value of this product in 1903 over the preceding year was the greatest recorded since the gathering of statistics of the industry began, and back of that is a record of steady increase every year, which means not only that it is growing, but growing faster every year. The total value of this product in 1903 was $6,453,849, making this product fourth in point of value, it being exceeded only by common brick, fire brick and sewer pipe, in the order named. But the percentage of increase was greater in paving brick than any other line, a hint that it may crawl up closer yet to the head of the list in the near future.

CONVENTION OF ONTARIO CLAYWORKERS.

The third annual Convention of the Ontario Clayworers' Association was held at Waterloo Ontario, Canada, December 7th and 8th. The attendance was good, being larger than at any previous meeting. The papers and discussions following same will be given in a subsequent issue of THE CLAYWORKER. The following officers were elected for the ensuing year:

President, D. W. Moody, Highgate, Ont.; Vice-President, E. J. McCormick, Warwick, Ont.; Secretary, Charles H. Bechtel, Waterloo, Ont.; Treasurer, N. James, Delaware, Ont. The Executive Committee consists of the officers and Byron E. Bechtel, Waterloo, Ont., who served last year as President of the Association. The next convention will be held at Hamilton.

THE SUNNY SOUTH.

It is always in order for a worker of clay to point out the superiority of brick as a paving material, but there are special occasions arising from time to time that offer opportunities for more effective work than others, and, in this light, the turning Southward for the next gathering of the clans furnishes opportunities for spreading the doctrine of brick paving. We all know that brick is superior to asphalt, for example, regardless of climatic conditions, for brick will stand traffic best under any climate, but when we get into the warm climate of the South the contrast is shown more strongly. The long hot summers soften up the pitch in asphalt paving and start the patcher to going sooner than in the cities farther North, and we all know the patchwork comes all too soon, even up there.

The South should furnish a specially rich field for brick paving in the near future, not only on the grounds of superiority of brick, but because of the rapid growth of Southern cities and the unusual amount of paving that will be put down in the next few years. A striking example of the growth and prosperity of the South has been furnished this fall by the demand for agricultural implements, which have not only doubled, but trebled the regular sales, standing out in striking contrast with the demand from the North country, notwithstanding that this has been a prosperous year up there, too, and they are doing their fair share of buying. It is simply an evidence of the greatness of the New South, and is the forerunner of what we may expect in the way of city improvements, improvements both in the way of street paving and modern buildings. As stated heretofore, there has been money going into the South from the North country right along, but the last few years has brought home to the Northern investor the fact that the South is a good place to live as well as make money, so they are moving their families down there and inviting their friends to do the same, and what this means in the way of improvements in the cities is already heralded by the agricultural demands from down there, for rural prosperity means city growth just as certainly as it means a demand for more modern implements.

With all this before us, there is nothing more timely than the idea of having the next meeting of clayworkers down there. It puts us on the ground at the awakening, so to speak, and will, on the other hand, serve to impress the South country with the prominence of the clayworking industry in the upbuilding of a country, and especially in street paving. And, by being on the ground at the right time, it puts the clayworker in a better position to see what is coming and figure on how much of it may be made useful to himself, either directly or indirectly. Then, the trip South will be worth while itself, as it will be a journey into a milder climate for the Northern delegates, and, aside from the many sights that can be taken en route, there will be a chance to view the new center of the iron industry, for that is what Birmingham is. Birmingham was founded in July, 1871, and what is reputed to be the first house ever built was a very crude box affair, bearing striking resemblance to a wayside blacksmith shop, and it struggled along like any other growing city, till not so many years ago; when it awoke to the fact that there was a peculiar advantage in having both iron ore and coal within a small radius, and since that time things have been humming down there, other cities, with different names, springing up on all sides, though still centering around Birmingham proper. These suburban cities, which are all linked together with street car lines and business interests around Birmingham, and their population are given in a pamphlet issued by the Birmingham Commercial Club as follows:

Birmingham, in corporate limits	47,500
Avondale, incorporated	4,250
Woodlawn, incorporated	5,060
East Lake	4,000
North Birmingham, incorporated	3,500
West End, incorporated	2,000
Pratt City, incorporated	7,000
Ensley, incorporated	7,000
Bessemer, incorporated	8,000
Wylam, incorporated	3,000
East Birmingham, not incorporated	1,500
Kingston, not incorporated	1,500
Elyton, Smithfield, Powderly, not incor.	6,000
Thomas, not incorporated	2,000
Gate City and Irondale	3,000
Savreton	2,200
Lewisburg	1,250
Clifton	1,000
Total	100,760

KANSAS BRICK MANUFACTURERS FORM AN ASSOCIATION.

Southern Kansas brick manufacturers have organized an association. A meeting was held at Cherryvale at which time the new association was formed. The brick manufacturing concerns of Pittsburg, Iola, Humboldt, Fredonia, Neodesha, Cherryvale, Sycamore, Peru, Mound Valley, Caney, Coffeyville and other southern Kansas cities, are represented in the new association.

The idea of the originators is to form a state association such as other states have, and become affiliated with the National Association of Brick Mannfacturers, which will meet next February in Birmingham, Ala. Robert Nesch, the head of the Pittsburg Vitrified Brick Company, attended the meeting at Cherryvale this week, as a representative of the plant here, and made an address to the association at the meeting Tuesday night. It is stated by the brick men that the object of the association is to look after mutual interests, and have organized protection whenever needed.

TRADE NOTES.

The Continental Brick Company, of Pittsburg, Pa., after some changes in the factory, under the direction of W. J. Carmichael, are now making a superior quality of sand-lime brick.

The Thew Automatic Shovel Company, Lorain, Ohio, report a very satisfactory volume of business transacted during the past year. Their plant has been run to its full capacity during the entire time and from present orders and prospects they expect to continue to do so. In fact, they may have to enlarge their plant if the demand for their shovels continues to increase as it has of late. They are now making four separate sizes of steam shovels, with a view of meeting the needs of clayworkers operating plants of varying capacities. The Thew shovel, which is illustrated on page 635, has fully demonstrated its capacity and economy.

The Indiana Drain Tile Company has been incorporated and will erect a plant for the manufacture of drain tile, building and paving brick, etc., at Brooklyn, Morgan County, Ind., some twenty miles Southwest of Indianapolis, where they have located an immense deposit of very fine shale and clay. The officers of the company are: President, J. M. Powell; Vice President, Frank Morris, and Secretary and Treasurer, S. Free. Mr. Powell is an experienced Hoosier tile manufacturer. He retired from active business a year or so ago, and now after an enjoyable season of rest, spent mostly in travel, he will again take up the work of converting Mother Earth into brick and tile with renewed enthusiasm. The plant will embody a number of new features not heretofore used in the manufacture of drain tile.

TRADE LITERATURE.

"AMERICAN SYSTEM FOR Making Sand-Lime Brick" is the title of a handsomely illustrated catalogue received from the American Sand-Lime Brick Co., Chicago, Ill. In addition to views of a number of their plants, located in various States throughout the country, there is a photograph of a sand-lime brick house built before 1860. It is a substantial two-story dwelling, and is said to be still standing and in good repair, after forty-four years of exposure to the elements. The book also contains some very interesting reading for those who are posting up on the sand-lime brick proposition. Write for a copy, mentioning THE CLAYWORKER.

THE BONNOT COMPANY, Canton, Ohio, have favored us with a copy of their latest catalogue. It is a book of 100 pages, printed in fine style. The cover design is exceptionally attractive, being a representation of a brick and terra cotta panel, executed in red, yellow and black on a rich brown paper. The book contains illustrations of their extensive line of brick and tile machinery, which includes represses, a variety of dry pans and wet pans, pug mills, cutting tables, clay crushers and disintegrators, screens and clay elevators, dryer cars, dump cars, hoisting machinery, and, in fact everything needed about an up-to-date clayworking manufactory. Clayworkers who make it a point to keep posted will find it a good book to keep on file. A copy can be had for the asking.

THE OLD FIREPLACE AT YULETIDE.

'Twas deep, and wide, and generous, with burning logs aglow;
With blue smoke curling upward, and a bed of coals below.
Its hearth was spread out like a lap, so motherly and kind,
And with its gracious memories my childhood is entwined.

My father sat on this side, and my mother knitted there—
The soft light playing tenderly upon her braided hair.
And in the interstices of this hallowed firelight,
A tide of peace flowed quietly, and glorified the night.

The children sat between them—seven links of love and time,
That poetized their lives into a rhythm and a rhyme.
For no "race suicide" could come before that sacred light,
And keep the smiling faces of the children out of sight.

The apples and the chestnuts that we roasted to a turn!
The popcorn that we'd pop, and, oh, the fingers that we'd burn!
The polished brass andirons, holding up the logs, meanwhile,
In dignified indulgence seemed to look on us, and smile.

When fun was high, the fire leaped and popped, and seemed to be
Endeavoring to enter into all the games and glee.
And though the windows rattled, and the storm came on apace,
There hovered safe contentment round this happy fireplace.

The stranger there was welcome, and was lightened of his cares,
For none know when they minister to "angels unawares."
The same impartial friendly light, with hospitable grace,
Fell like a benediction on the fair and withered face.

And when the back log broke in two, we kneeled in worship there,
While father wove his simple faith into an evening prayer.
The fireplace caught up these words, "withhold thy chastening rod,"
Enveloped them in sacred smoke, and sent them up to God.

When Christmas came, 'twas Christmas till the yule log burnt away—
And he who cut the yule log made a week-long Christmas day!
Around the mantel-piece were hung the stockings in a row,
And up the chimney there was room for Santa Claus to go.

He came down with a goodly pack, but now—poor Santa Claus
Must act the burglar—if indeed he comes to us, because
There is no honest opening into a fireplace—
No wonder he's so small, now, he's ashamed to show his face!

Oh, who can have a Christmas, with no hearth to gather round?
No place for all the children that have blessed your life, and crowned
Your years with wreaths of pleasure, and with festoons of delight!
The picture is so beautiful before the firelight.

Go get you back to Mother Earth, where bricks are born of clay,
And build yourselves a hearthstone, in the good old-fashioned way.
All shrunken is that sinewed hospitality of heart,
Because the dear old fireplace no longer takes a part.

MARGARET ANDREWS OLDHAM.

Washington, D. C.

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TRY AN ENGAGEMENT with me for one year as consulting engineer and you will be convinced of the advantage. Only a few more such engagements desired. Terms reasonable.

WILLARD D. RICHARDSON,
Consulting Engineer to the Brick Industry.

See pages 621 and 625.

WANTED, FOR SALE, ETC.

FOR SALE.

A large brick and tile plant at Vigo, Ross Co., Ohio; has been running all the time, and there is a market for all products. I will sell or rent it. Write to S. J. WOOLEY,
12 1 dm 152 Woodruff Ave., Columbus, Ohio.

FOR SALE—Treasury stock of the Cheyenne Pressed Brick Company, par value $100 per share. Being sold for equipment purposes at par, sale to close March 1st. Address
HORACE E. ADAMS,
12 1 c Hecla, Wyo.

WANTED.

A German kiln builder, who is practical and thoroughly familiar with every branch of kiln construction for the fire brick and ceramic industries, as well as chimney building and posesses patents of his own, wishes to start in business, and for this purpose desires to take a partner with capital. One who can attend to correspondence desired. R. HOHN,
12 1 dm 25 W. 76th St., New York City.

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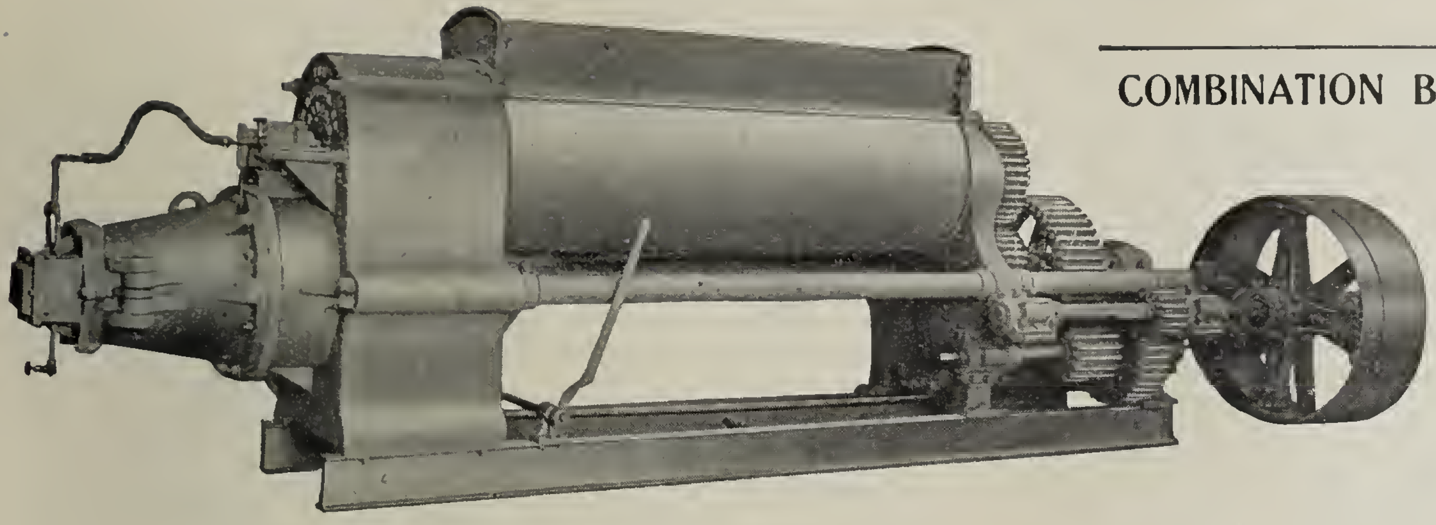

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THE
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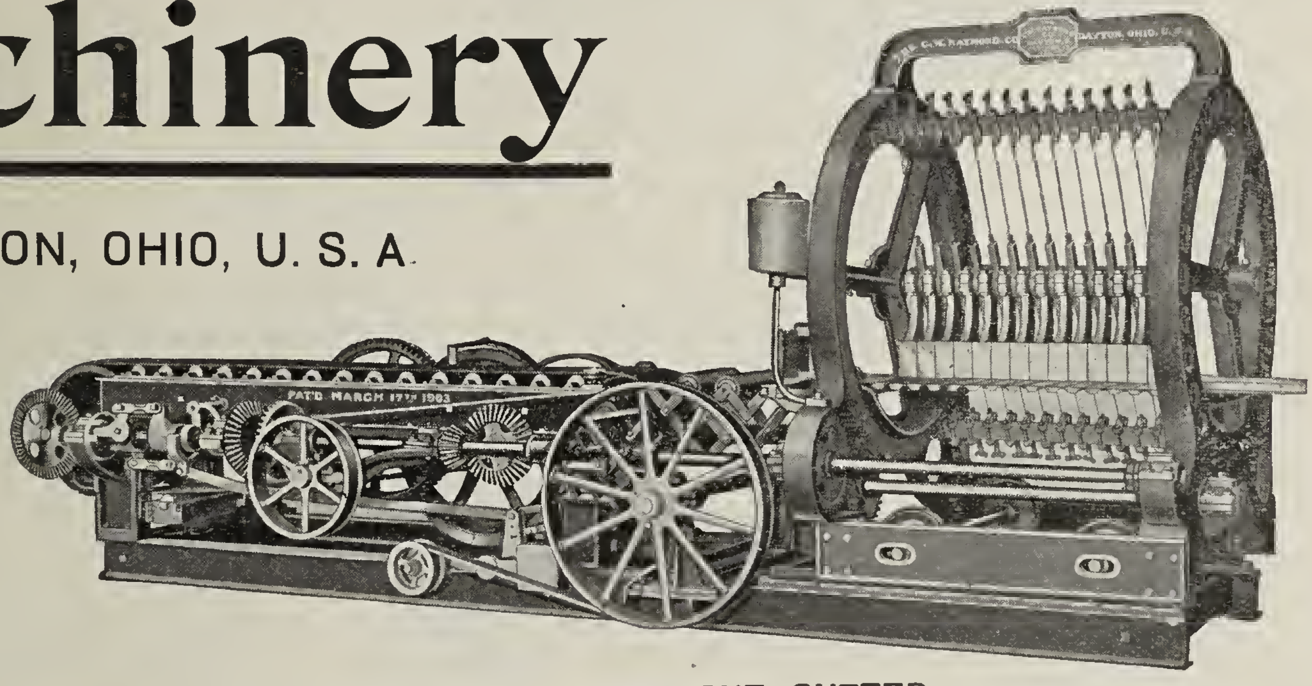

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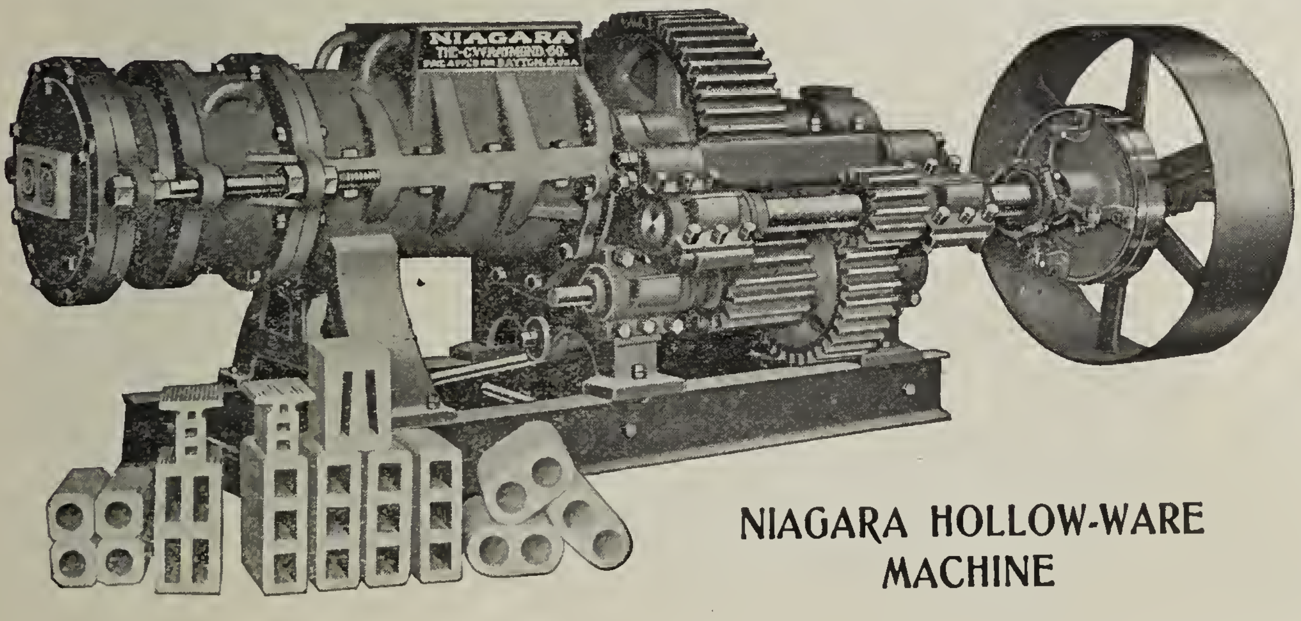


NIAGARA HOLLOW-WARE
MACHINE

Raymond Machinery
Creates New
Business for the User
Better Brick
and more of them.

CATALOGUE

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING SITUATION.

NOVEMBER WAS as good a building month in this city as October, and building operations continued full blast, while any number of buildings are planned to start in December, and it is now evident there will be a pretty good demand for brick here right through the winter. Most of the local plants will continue running regularly, with a possible shut-down for repairs at some time, but orders enough are on hand with most of them to make them work every day they possibly can.

It seems to have become fashionable of late, in this city, to plan a good deal of building for the winter months. Some of our large wholesale houses were built in the winter, and the Postal building is going to begin work on an addition within a few days, which will double its size, extending it to Wall street, making it run all the way through the block to Eighth, from Delaware to Wall. This is only one of many which are soon to begin, and the winter season should be a reasonably busy one. A great many small jobs are either now under construction, or will be begun shortly.

The November building permits are about one-third larger than for the same month of last year, the total for the month being $685,828, as against $453,270 the corresponding month of 1903, or an increase in value of $232,555. Of the permits issued, the value of the brick buildings was $335,600.

Chairman K. F. Allen, in his annual report of the manufacturers' committee of the Commercial Club, said: "The Kaw's mouth has 2,200 factories now, with 2,000 of them east of the river." He declared that he knew of five or six very large factories that would come here in the next year, and stated that more than 200 new factories had located here in the last year.

The large packers of Chicago, announced at the time Chicago was failing to protect their property, in the recent strike, that future developments in the packing line would be made along the Missouri river. It is now very evident Kansas City is to have its share of this development. Two new packing houses have broken dirt for plants to be erected right away, and Swift & Co. are making additions to their plant to the value of $250,000, to include a soap factory, while Schwarzschild & Sulzberger are going to spend about $500,000 in enlarging their plant. All this packing house development is in Kansas City, Kansas, just across the line, and does not come in under the building permits of this city. Upon the completion of these new plants and additions, this city will surpass Chicago as a packing center.

Business men of this city are much pleased over the closing of the World's Fair. A conservative man was speaking of the immediate effect of the Fair on this city, and stated that there was no question that $3,500,000 of the ready money of Kansas City had been spent there this year, while there was as much more spent by people living within 200 miles of this city. This means $7,000,000 taken out of the regular channels, and, of course, it has had a big effect in all lines of business.

It is estimated that in this city alone there is now under way at least $1,000,000 worth of public improvements, and paving and sewers are among the big items. The greater part of the paving is asphalt, but still there has been a good deal of brick paving of late. The Kansas City Paving Brick Company reports that it still has about 700,000 brick to deliver in this city, on paving jobs, and will soon have them in the hands of the contractor, as they have finished their contract in Lexington, Mo., and also in Trenton, Mo.

The contractors in the city will be very careful in future to have a clause in their contracts giving them an extension of time under certain circumstances, as the Court of Appeals has just handed down a decision which has caught some of them who depended upon getting the extension the same as they had in other cases.

Robert Nesch, president of the Pittsburg Brick Company, and also a member of the American Portland Cement Company, which is building a cement plant in Neodesha, Kansas, which will have a capacity of 1,800 barrels of cement per day, is now putting in most of his time looking after the new business, as he can leave the brick company and feel easy, owing to the fact that they are loaded down with orders, and it is only a matter of turning out the brick.

I. N. Soper, of the Cement Brick Company, will leave for New York in a few days, and right after the first of the year will be married to Miss Ollie Garnsey, of that city. Mr. Soper has varied business interests in this city, and has been too busy to the present time to think of getting married, but now it appears that he feels it is impossible to delay the matter in any way, business or no business.

The Dwyer Brick Company is reporting business good at this time, and prospects exceptionally fine. They have caught up with their orders.

The Kansas City Hydraulic Pressed Brick Company is reporting orders exceptionally heavy for this season of the year, and that prices are at the right figure.

The Pittsburg Brick Company has shut down its Leavenworth plant for the winter, but will operate both the Sycamore and Pittsburg plants through the entire season, with the possible exception of a shut-down of a few days for repairs.

The Flanagan Bros. Manufacturing Company is reporting plenty of orders for brick, and say the plant will continue to run regularly.

The Stukenberg Pressed Brick Company is having a better demand than usual at this time, and expects to close up contracts which will keep the plant busy through the winter.

The Standard Stone and Brick Manufacturing Company report their orders well cleaned up for the season, and they are now engaged in putting up a new office building, made from their own manufactured stone.

The Kansas City Hydraulic Pressed Brick Company is to move from its present quarters on the second floor of the Postal building to the fifth floor of the Gumbel building, on the corner of Eighth and Walnut streets.

A case has been filed in the supreme court of Kansas which is expected to settle the smoke nuisance question in Lawrence, at least. Delia Phillips is the plaintiff, and she asks judgment for $3.150 against the Lawrence Vitrified Brick and Tile Company for alleged damage to her shade trees and prays for a perpetual restraining order requiring the brick company to operate its plant without bothering her with smoke. The case was recently decided in favor of the brick company in the District Court of Douglas county. It is the first case of the kind that has ever been before the Supreme Court, and the decision will be watched with considerable interest.

The Abilene Sewer Company has been incorporated in El Paso, Texas, with a capital stock of $25,000.

S. L. Wood, of Seattle, Wash., has purchased an interest in the Harper Brick Company, of Colby, in that State, and will take the active management of the plant. The capital stock is to be increased, and the plant made thoroughly up to date.

R. Stafford has purchased the brick manufacturing business of L. C. Romas, in Abilene, Tex. C. A. W.

A MOVE IN THE RIGHT DIRECTION.

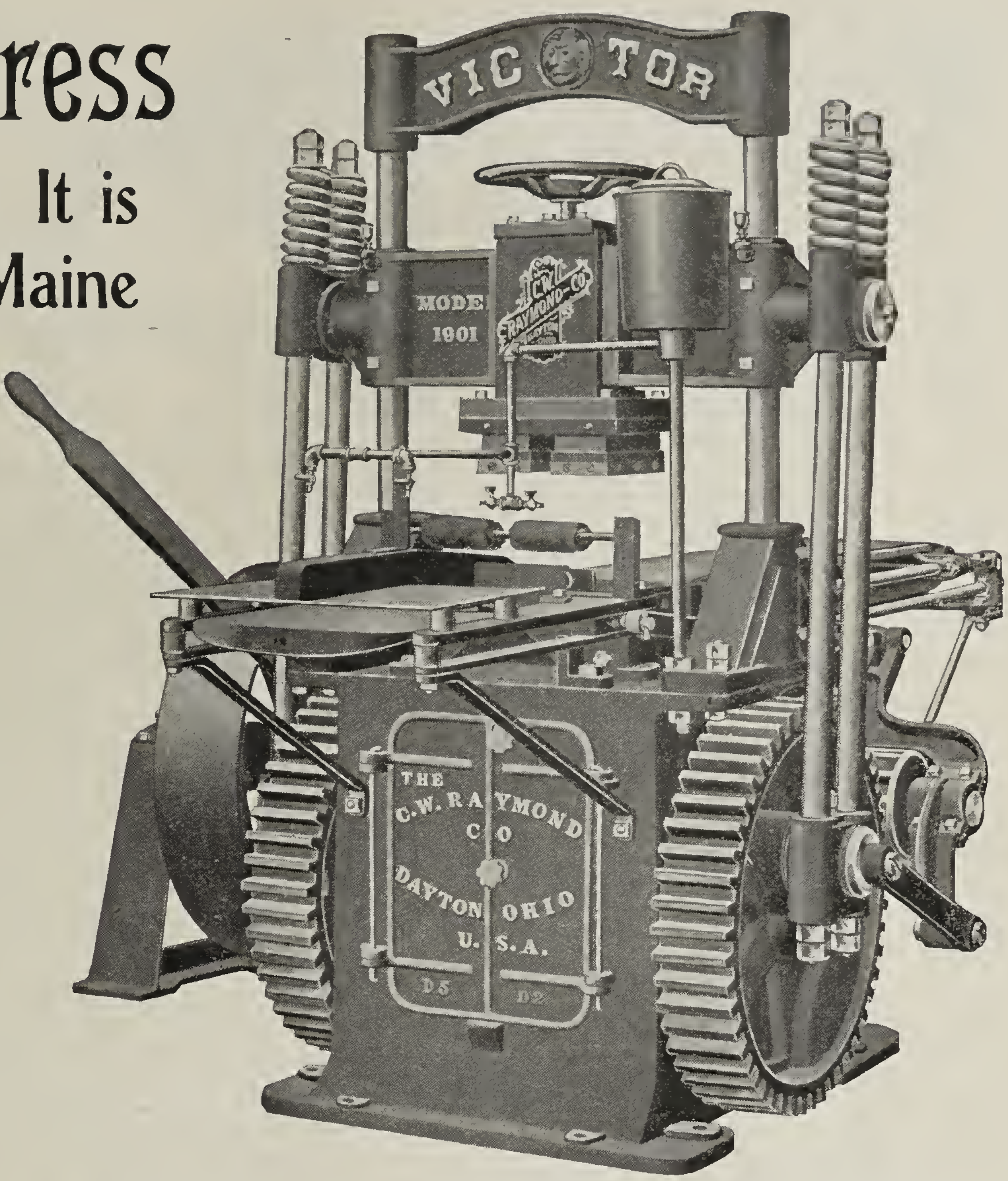
The late Mr. A. S. Moulton, in his will, left a site of land near the railway station at Stoke-on-Trent, England, for the purpose of providing a technical and university college. The land is valued at £7,000. The proposed erection will, it is estimated, cost £25,000. The North Staffordshire Institute of Mining will contribute about £5,000, and the County Council have promised £4,000, and it is hoped that by voluntary subscriptions a sum of £10,000 will be raised. The college will contain a section for instruction in pottery, and this feature of the work to be carried on has given the liveliest satisfaction to a large number of people in the immediate vicinity, who are chiefly engaged in clayworking.—*Brick and Pottery Trades Journal.*

PATENT SUIT.

Suit was brought Feb. 23, 1904, against the Hamilton Brick Company, of Hamilton, Ohio, by the Horton Manufacturing Company, of Painesville, Ohio, for infringement on their patent on their Hercules brick machine. The Hamilton Brick Company is using a machine made by the Arnold-Creager Co., of New London and Cincinnati, Ohio., and is called by various names such as "S. S. S.," the "New Century," the "Success," etc. 5tf L.

The Victor Re-Press

needs no introduction. It is known and used from Maine to California, ⁕ also, somewhat in Europe, Asia and Africa.



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has more crushing power, and more screening surface than other pans--heavier too

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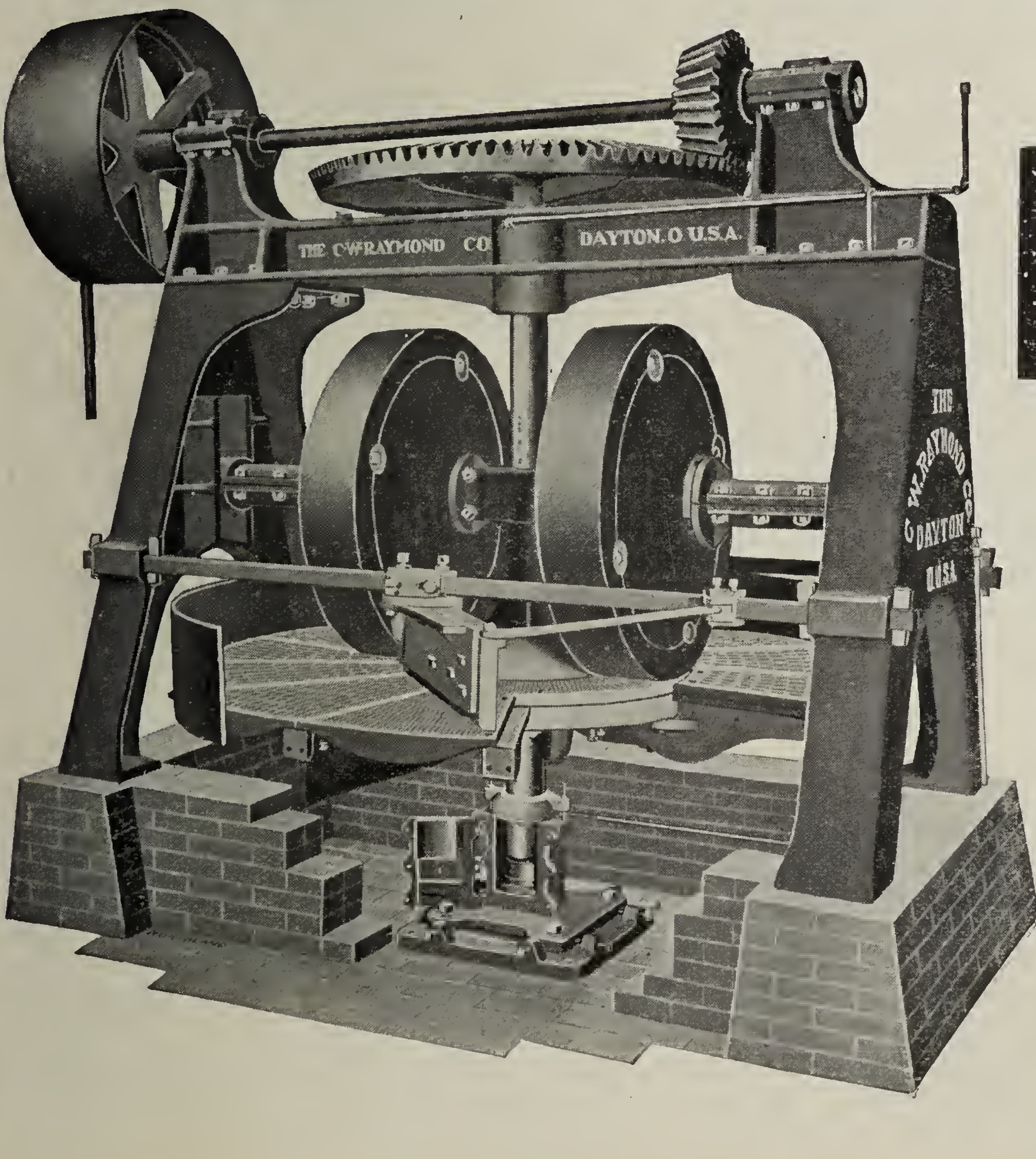
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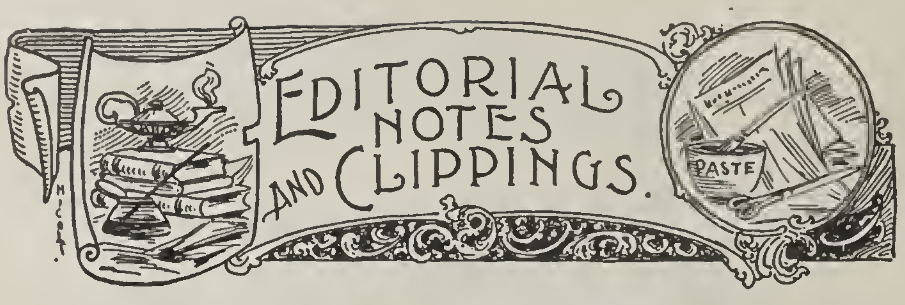

EDITORIAL NOTES AND CLIPPINGS.

CASTING ITS CHEER BEFORE.

At your plate now and then is a sprig of holly;
The landlady, too, condescends to be jolly;
On the face of the waiter girl a smile we see,
And the janitor's as gracious
as
he
can
be.

William Worthman will establish a new brick plant at Seward, Neb.

The Globe Press Brick Company has been chartered to manufacture brick at Ferris, Texas. Capital stock, $30,000.

Athens Pottery Company, Athens, Texas, are using the Tecktonius kiln band lug on their kilns under construction.

John Gillam will establish a large brick manufacturing plant at Coffeeville, Kan., where he has a fine deposit of fire clay.

J. J. Thompson has bought a brick and tile machine and will start a brickyard at Blanchard, Iowa, early in the spring.

The Ayres Mineral Company, Zanesville, Ohio, write that they would like to purchase a secondhand dry pan in good condition.

The Simons Brick Company will establish a factory at Santa Monica, Cal., for the manufacture of pottery, brick, tile and clay shingles.

Liberty, Kan., wants a brick and tile plant. They have plenty of good shale and natural gas for fuel. Interested parties can address Maloney & Burt.

The Mason City Brick and Tile Company and the American Brick and Tile Company, both of Mason City, Iowa, will install an electric lighting system.

L. S. Kissel & Sons, who have been experimenting with their clays, have found the experiments successful and will soon establish a brick plant at Hartford, Wis.

Frank C. Grote, Cincinnati, will organize a company to develop an immense tract of clay land which he owns in Kentucky. John S. Haley, of Saulsberry, Ky., is also interested.

A large brick plant will be built at Sparta, Ohio, by the Walker Mining and Manufacturing Company. The main office of the company will likely be at Cleveland, Ohio.

The Karthaus Fire Brick Company, Karthaus, Pa., has been incorporated with $150,000 capital stock. Rev. Kyler, J. Kyler, P. L. Knecht, W. C. Weaver and others are interested.

E. C. Tecktonius Manufacturing Company, Racine, Wis., supplied the Dixie Fire Brick Works, Puryear, Tenn., the necessary amount of kiln band lug to make a lasting job of their kilns.

In renewing their subscription to THE CLAY-WORKER, the Trenton (Mo.) Brick and Tile Company say they will build an entire new dry-press brick plant this winter. They have a fine quality of shale.

Articles of incorporation have been filed by the Star Lumber and Brick Company, of Vanndale, Ark. The officers of the company are James N. Hall, president; A. N. Schwing, vice-president and treasurer, and T. E. Hare, secretary.

At the annual meeting of the directors of the Standard Brick Company, held at Alexander, Va., recently, the following directors were elected: Park Agnew, T. L. Holbrook, F. Mertens, William A. Richards, Walter T. Rogers, William T. Walker and Henry P. West.

The brickyards at Table Rock, Ark., have practically shut down for the season, although there is yet some burning to do. After the most prosperous year of their history, the output of the two plants for the season of 1904 aggregated nearly 10,000,000 brick. The demand throughout the entire season far exceeded the supply, and many orders had to be turned down, owing to their inability to fill them. Recently a deal has been consummated whereby the two yards have been consolidated, the Table Rock Clay Company taking the Cotton plant and issuing stock in their company to the owners in payment therefor, and with the beginning of another year the two plants will be operated under one management.

Chester and Harry Larison will start a brickmaking plant at Treynor, Iowa.

L. E. Hellner and E. Strandel will start a brick plant at Crookston, Minn.

W. M. Fox & Bro., Obion, Tenn., have in use the Tecktonius lug on their kiln bands.

The Aberdeen Sand and Brick Company has been incorporated to manufacture sand-lime brick at Aberdeen, Miss., with $70,000 capital stock.

The Buchwald Brick and Tile Company has been incorporated at Marshallton, Iowa. B. F. Cummings is president and Charles A. Buchwald is secretary of the concern.

The Hanover Brick Company, Morris, N. J., with plant at Boonton, has just booked an order for 1,500,000 vitrified brick for the Pennsylvania Railroad tunnel.

The Davis Brick and Tile Company of Tampa, Fla., are now preparing to manufacture sand-lime brick as well as clay brick, and so will be able to meet all competition.

The Savage Mountain Fire Brick Company, Cumberland, Md., has just completed a tunnel 800 feet long above Frostburg and opened an extraordinary grade of fine fire clay.

W. W. Schwengel writes that he is going to manufacture brick at Johnhston, Pa., in the spring and so orders THE CLAY-WORKER sent to his address, as he desires to read up on the business.

The Silicated Brick Company of Denver, Colo., was incorporated some time since and will establish a plant for the manufacture of silica brick. R. E. Dolan is secretary of the concern.

I. C. Adams, Wellman, Iowa, has fastened the bands of his kilns with a lug that will never give him trouble. It is manufactured by the E. C. Tecktonius Manufacturing Company, Racine, Wis.

Calvert & Leck will enlarge their brick plant at Ogden, Utah, making improvements that will cost in the neighborhood of $10,000. When completed the plant will have a daily capacity of 65,000 brick.

The Childersburg Brick Company has been incorporated to manufacture and sell brick, terra cotta and drain tile at Talladega, Ala. The incorporators are L. W. Clardy, W. R. Brannon and W. P. Glazenir.

The Berkshire Pressed Brick Company has been organized at Great Barrington, Mass., with $150,000 capital stock. Sand-lime brick will be manufactured, and they expect to have the plant in operation by the first of April.

The Warsaw Sand-Lime Brick Company has been organized at Warsaw, Ind., and a plant will at once be erected for the manufacture of sandlime brick. Dr. J. M. Bash, Dr. I. B. Webber and A. W. Butler are interested.

The Newburg Brick Company has been organized to manufacture sand-lime brick under the American system at Newburg, N. Y. Those interested are George R. Mitchell, James S. Taylor, William Johnston McKay and William T. Hilton.

The brick plant of William Sipher at Medina, Ohio, has been purchased by Akron men, who have organized the Medina Brick Company. The men composing the firm are William and Shadrack Wargon, Edward Peterman and William Matthews. The plant will be improved and brick and tile manufactured on quite an extensive scale.

William R. Sebring, part owner of two of the Sebring potteries at Sebring, Ohio, was run over and instantly killed by a passenger train on the Pennsylvania line at that place. He was crossing the track, and being partly deaf, did not hear the approaching train. He was thirty-four years old and one of five brothers who built the town of Sebring some six years ago.

Matthew H. Dale, of Scranton, Pa., died at the Emergency Hospital at Buffalo, N. Y., November 22. His death was the result of heart failure brought on by the amputation of his left foot, which had been crushed under a moving train a day or two previous. Mr. Dale was en route to Mt. Clemens, Mich., and got on the wrong train at Buffalo. Discovering his mistake just as the train was pulling out of the station, he jumped from the train, and, falling to the ground, his foot was thrown under the train and crushed so badly that amputation was necessary. Mr. Dale was a prominent citizen of Scranton, Pa., being identified with a number of business concerns, chief of which was the Scranton Vitrified Brick and Tile Company. He had been a member of the N. B. M. A. for some years and had attended

[CONTINUED ON PAGE 610.]

The "Big No. 6" "Monarch" Brick Machine.

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Machines
in use.

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500
"Quaker"
Machines
in use.

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Pug Mills,
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Drums,
Dump Carts,
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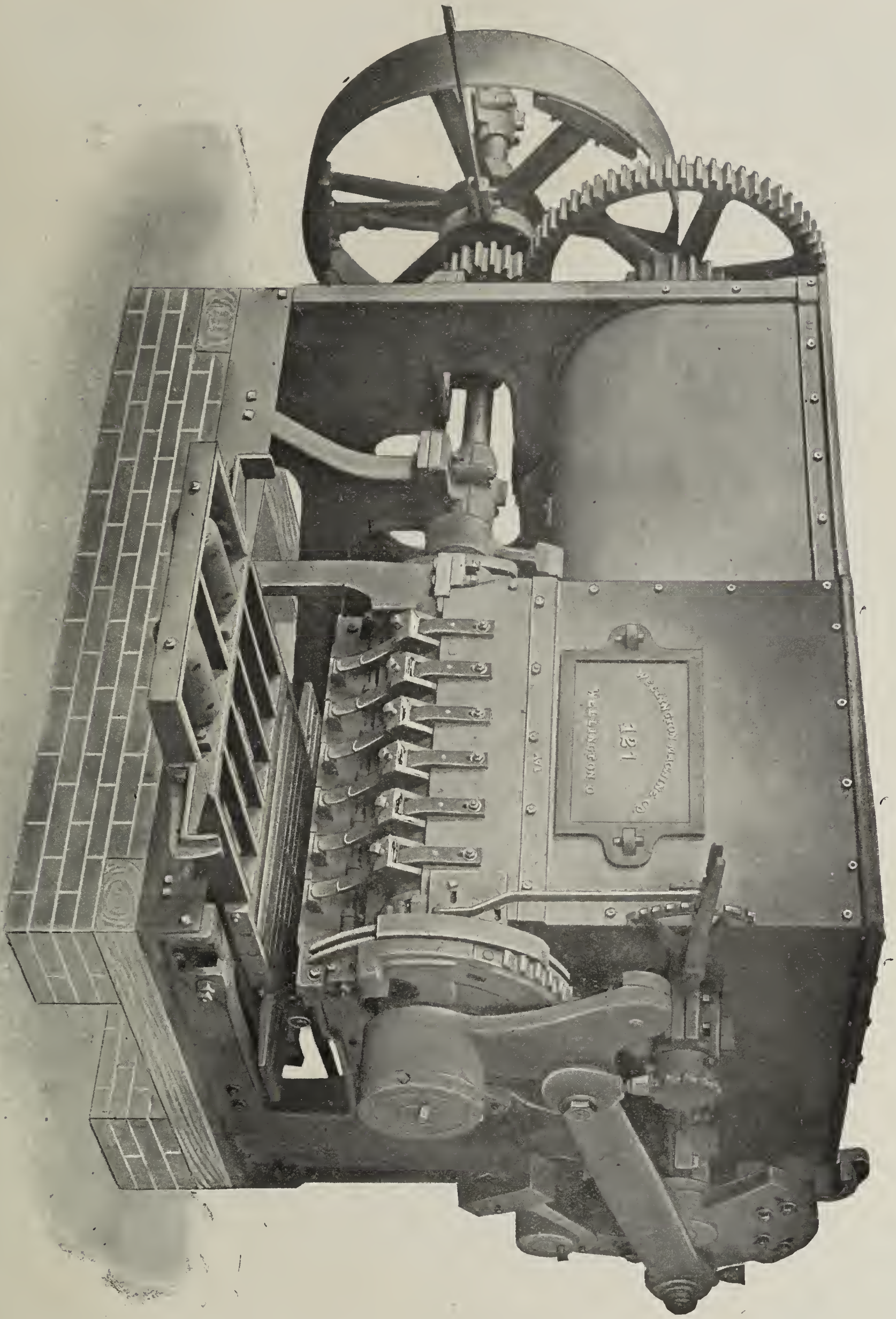
Dump Tables
and all
kinds of
Kiln
Castings.



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ROLLER-BEARING
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The Wellington Machine Co.,

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EDITORIAL NOTES AND CLIPPINGS—Continued.

many conventions. Mr. Dale was in his sixty-seventh year and leaves one daughter and three sons.

The Norfield (Miss.) Brick Company advise us that they are in the market for dry press machinery.

The Hyatt Brick Company has been chartered at Columbia, S. C. F. H. Hyatt and J. H. Rodgers are interested. The company has $20,000 capital.

The plant of the Tallmadge Clay Manufacturing Company, located at Tallmadge, Ohio, was destroyed by fire recently. The loss is estimated at $5,000, partly covered by insurance.

Sligo Fire Brick Company, Sligo, Clarion county, Pennsylvania, have placed their second order with the E. C. Tecktonius Manufacturing Company, Racine, Wis., for kiln band lugs.

The M. J. C. Manufacturing Company has been incorporated to manufacture clay products at Danville, Ill. The incorporators are W. C. Johnson, B. H. McMillan and F. M. Collard. They have $75,000 capital stock.

A new company has been incorporated to manufacture sand-lime brick at Asbury Park, N. J. It will be known as the Chesapeake Land, Gravel and Brick Company, and work on the plant will be commenced at once.

The Southern Ohio Brick and Tile Company has been incorporated at Portsmouth, Ohio, with a capital of $75,000. The company will erect an immense brick plant in the eastern part of the county. The incorporators are Marvin Clark, A. T. Holcomb, E. H. Clare, M. H. Shummay and T. J. Morgan.

The Superior China Clay Company, Chippewa Falls, Wis., have for sale an American Blower Company heater, steel dryer cars, filter presses, slip pumps and other machinery, all in good order. We would advise those of our readers looking for a secondhand equipment of this sort to write the company.

In renewing their subscription to THE CLAY-WORKER the Onondaga Vitrified Brick Company, Warners, N. Y., say they have had a very satisfactory trade the past season, having been favored with all the orders they could take care of. They add: "We are working full time, making all the brick we can and selling all we make."

A new firm has been organized at Jacksonville, Fla., to be known as the McDonald Patent Brick Company. M. C. Drew Abraham West, J. A. Davis, G. W. Canfield and Mr. McDonald are interested. The company has a capital stock of $20,000, which will be increased as occasion demands. A plant will be established near the outskirts of the city.

The Glens Falls (N. Y.) Brick Company, of which Mr. D. P. DeLong is proprietor, has just received an order for 1,500,000 red brick for the New York market. This is the largest individual order booked by this company for some time and the first brick to be shipped to New York for many years, on account of the previous high freight rate which prevailed.

The Houston White Brick Company has been incorporated at Houston, Texas, by J. M. Rockwell and Frank Jones, Houston; B. Dolson, Galveston, and E. D. Steger, Bonham. Mr. Fred C. Jones, of Houston, is engineer in charge of the construction of the works, which he expects to have ready for operation in about sixty days. The product will be white sand-lime brick.

The demand for the product of the Auburn (Pa.) Shale Brick Company has been so great the past season that they have scarcely been able to meet it, and at a meeting of the stockholders of the company recently plans were discussed for increasing the capacity of the plant and the work will commence at once. They now have a capacity of 35,000 to 40,000 brick a day. W. F. Oswald is general manager of the plant, and is secretary and treasurer of the company as well.

A company has been incorporated to manufacture clay products at Brazil, Ind., to be known as the Brazil Clay Company. The board of directors is composed of the following gentlemen: Joseph Martin, Rosedale; Edward Shirkie, Clinton; A. D. Scott, Sullivan; William Zeller and J. H. McClelland, of Brazil. The capital invested represents persons from Indianapolis, Sullivan, Rosedale, Clinton, Chicago, Terre Haute and Brazil. The company is capitalized at $50,000.

The Boone (Iowa) Brick, Tile and Paving Company have had one of the most successful years in their history. The plant was enlarged during the past season and now has a capacity of 10,000,000 brick a year. The company manufactures bricks of all kinds—pavers, building and sewer brick, hollow ware and drain tile. The equipment now consists of ten kilns, with a combined capacity of 900,000 brick. A new dry kiln has been built this past summer which utilizes the waste heat from the baking kilns. This new kiln has a capacity of 33,000, which, with the old kiln, gives a drying capacity of 100,000 brick.

The new plant of the Central City Granite Brick and Block Company, at Jackson, Mich., is fast nearing completion, and pressed brick will soon be turned out at the rate of 20,000 per day.

The Hudson Pressed Brick Company, Albany, N. Y., has purchased the Hosford farm near that place, on which there is a fine deposit of clay, and will erect a brick plant on the site in the very near future.

The Indiana Sand-Lime Brick Company has been organized at North Judson, Ind., by Jacob Keller, Frank C. Tracy, Silas Myers, William Lulsen and others of North Judson, Ind., with $30,000 capital stock.

C. J. Swanson, of Fridley, Minn., has built a substantial brick church, which he has presented to the people of Fridley township, where his brick plant is located. That the church members of that community appreciate Mr. Swanson's generosity goes without saying.

The brick manufacturers of York county, Pennsylvania, are experiencing an unusually good trade for this season of the year. One of the plants at York has recently been shipping five carloads of brick daily to Baltimore, and many of the other plants are sending almost their entire product to that point also.

The Union County Pressed Brick and Tiling Company has been incorporated at New Albany, Miss., with $25,000 capital stock. J. T. Baker is president, D. H. Hall vice-president, T. F. Baker secretary and treasurer and F. C. Houck is general manager of the company. Work on the plant will be pushed to completion as rapidly as possible.

The brick plant of P. B. Broughton at Lewis Run, Pa., was almost completely destroyed by fire at an early hour December 1. The loss is estimated at about $25,000, on which there is about $8,000 insurance. Most of the loss is on the machinery, which was badly twisted by the heat. This is the second time in three years the plant has been visited by fire. It will in all likelihood be rebuilt without delay.

The big brick plant of Grim Brothers at South Allentown, Pa., was completely destroyed by fire recently. The plant was shut down for the winter three weeks previous, so that the origin of the fire is a mystery, as there was no fire about the plant. The loss is placed at $15,000, on which there was no insurance. Messrs. Grim state that the plant will be rebuilt in time to resume operations in the early spring.

J. T. Dean has purchased sixty acres of land, on which there is an inexhaustible deposit of clay, from Dr. R. R. Sutherland and W. B. Lomas, of Knoxville, Tenn., on which he will erect an immense brick manufacturing plant. The clay has been thoroughly tested and proven to be of the best quality for good red building brick. Mr. Dean wants to have his plant ready for operation in the early spring.

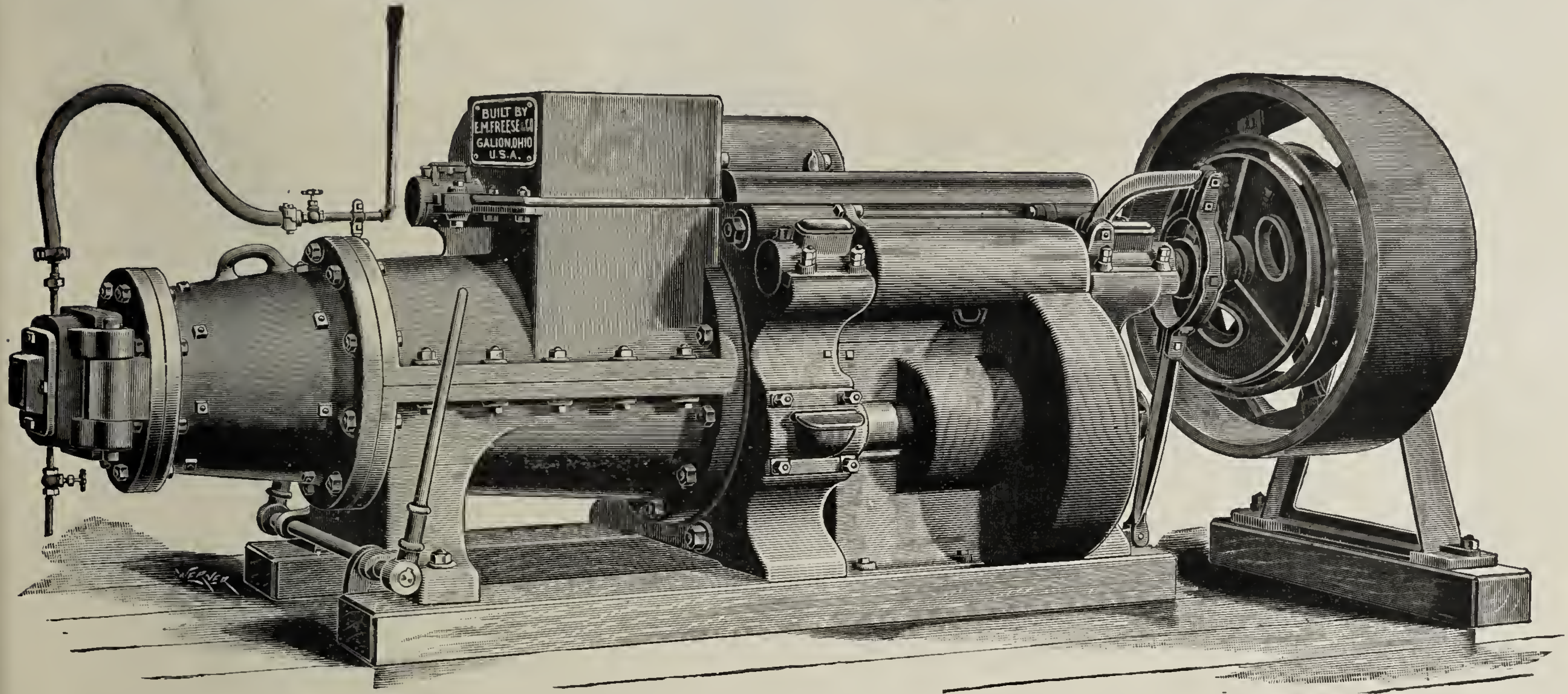
The Estacada Brick and Tile Company is the name of a new organization at Portland, Ore., that has been organized with $75,000 capital stock. They have a deposit of clay which has been tested and pronounced a very superior quality clay for ornamental facing brick as well as common builders and drain tile. A plant will at once be erected of 40,000 daily capacity and will be equipped with machinery from the shops of the Chisholm, Boyd & White Company, Chicago.

The properties of the Great Eastern and National Clay Manufacturing Companies at South River, N. J., which recently went into bankruptcy, were sold at the court house November 29 by the receivers. The plant of the Great Eastern Manufacturing Company was sold for $325,000 that of the National Clay Manufacturing Company for $48,000. Both plants were purchased by F. B. Schenck, president of the Mercantile National Bank, who is chairman of the reorganization committee and for whom he bought the plants. The purchasers will reorganize the plant and continue the business.

The United States Brick Company has been formed in Reading, Pa., with these officers: President, Albert A. Gery, Reading; treasurer, W. W. Light, Reading; directors, A. J. Brumbach, Lambert A. Rehr, H. L. Boas, W. W. Light, Albert A. Gery, Richmond L. Jones, Dr. Walter A. Rigg, Jere G. Mohn, Nathaniel Ferguson, John G. Mohn, Wilson Ferguson and John E. Harbster, all of Reading, and Robert E. Brooke, Birdsboro; B. Dawson Coleman, of Lebanon, and George H. Valentine, of Womelsdorf. The company is the owner of all of the A. A. Gery patents for the manufacture of brick. The United States Brick Company will organize companies in the various large cities. The company has secured control of the Montello Brick Works Company's four plants, one of which is located at Montello, one at Wyomissing, one at Perkiomen and one at Oaks, all in Pennsylvania, with

[CONTINUED ON PAGE 612.]

Our Mammoth Brick Machine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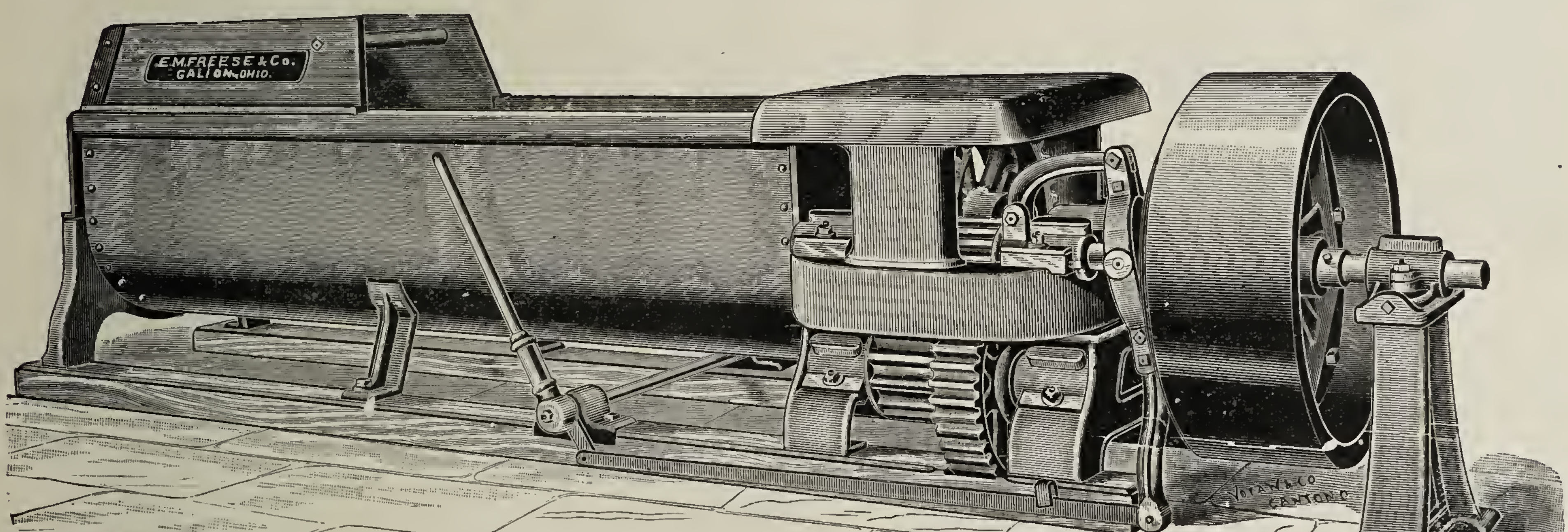
THIS MACHINE is built from new and improved design and has been found especially well adapted to the use of plants requiring large capacity and superior quality of brick. We build this machine in two sizes.

Our Pug-Mills Have Features of Great Merit.


E.M.FREESE & Co.
GALION, OHIO.

THESE PUG-MILLS have especial advantages. They can be adapted to the nature of the clay and will thoroughly temper and mix. Material of best quality and in generous quantity used in their construction. The workmanship is good and the clay is fitetd for making a fine quality of brick.

E. M. FREESE & CO., = = Galion, Ohio.

Mention The Clay-Worker.

See Ads. on Pages 652 and 653.

EDITORIAL NOTES AND CLIPPINGS—Continued.

a combined capacity of about 450,000 brick a day. All of the companies will operate under the Gery patents.

A. W. Mitterer has purchased the brick and tile plant of Robert Todd at Gifford, Iowa. Mr. Todd will take up some other line of work.

The Great Western Pottery Company, Kokomo, Ind., knows a good thing when they see it. They recently ordered the Tecktonius lug to make a sure job of the banding of their kilns.

Bierce & Wygantz have purchased the Corey Pressed Brick Company's plant at Lehigh, Iowa. Mr. Bierce is an old-time brick man, while Mr. Wygantz is an engineer of considerable experience.

E. C. Tecktonius Manufacturing Company, Racine, Wis., recently furnished the Kittanning Brick and Fire Clay Company, of Kittanning, Pa., their kiln lugs to be used on twelve bands that required a positive, sure-holding band lug.

The Evolution Brick Company is the name of a new company organized to manufacture brick at Mexico City, Mexico, by a new process, the patents for which are owned by C. M. Sandoval, St. Louis, Mo. The new plant is to have a capacity of 40,000 brick a day.

Fred Maas, the proprietor of the Menominee Brick ompany, Menominee, Wis., died at his home in that city December 4th. Mr. Maas had been afflicted with heart trouble for some time, and the burning of a shingle mill of which he was owner brought on the shock which caused his death.

The Tri-City Brick and Sandstone Company, Moline, Ill., have their plant at that place well under way and expect to be turning out brick at the rate of 25,000 to 30,000 daily in a short time. They already have a number of orders on their books and are anxious to begin operations.

Referee James Parker has issued an order directing the sale of the brickyard and plant of W. F. Fisher, Sayreville, N. J., at private sale, the selling price being fixed at not less than $65,000. If the plant cannot be disposed of at private sale, it will be sold at auction. The encumbrances against the title are mortgages amounting to $54,000.

Justice J. A. Blackburn died at his home in Leavittsburg, Pa., November 22, after a protracted illness. Mr. Blackburn had been interested in the brick business for many years, having been instrumental in organizing the Blackburn Face Brick and Tile Company, the B-K Enamel Brick Company and the Pittsburg Brick and Tile Company. He will be sadly missed in the community in which he had passed all his life.

The citizens of the village of Horseheads, N. Y., now known in that section of the country as "Industrial Horseheads," recently celebrated the installation of the water works and electric light system by tendering a banquet to the board of trustees and a number of visitors from neighboring towns. Horseheads is the home of R. G. Eisenhart, one of the ex-presidents of the N. B. M. A., and Mr. Eisenhart is president of the village of Horseheads, and this to those of us who know Mr. Eisenhart explains the reason why Horseheads is such a thriving, enterprising town.

"NOTICE TO CIRCULAR KILN USERS."

Write the E. C. Tecktonius Manufacturing Company, Racine, Wis., for their best prices on kiln lugs when in the market for a device of that kind. The reply you receive from them is certainly a winner, as they ask no pay if their lug is not all they claim for it. This statement proves to the skeptical that Tecktonius knows the merits of his goods, as they could not make a statement of that kind unless they had the article to back them.

BUSINESS IMPOSSIBLE WITHOUT APPRENTICES.

The position of trades unions on the apprentice question, writes Thos. E. Durban, makes it utterly impossible for the manufacturers of this country to get skilled mechanics to supply the demand. The old age and death ratio among mechanics is larger than the ratio that the unions allow for apprentices. In some of the crafts the unions are demanding that only one apprentice be employed to every ten journeymen, and in almost all the trades it is impossible for the manufacturer to employ under indenture of apprenticeship a sufficient number of young men to meet the requirements of that particular trade. The sole idea of the labor unions is to limit the number of men and place the demand in excess of the number; in other words, to have three or four jobs for every good mechanic.—*Building Bulletin.*

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE OUTLOOK for a growing business on the coast continues to improve, and there can hardly be a doubt that next year will be as good, if not better, than last. The recent convention of labor unions in San Francisco was a reminder that labor unions are still a great power in this territory. It is anticipated by contractors that there will be some labor disturbances in the spring. This is the factor which for the past few years has made capitalists conservative about putting their money into building, but beyond that there is every prospect of a prosperous building activity.

John Hill is now engaged in the manufacture of brick at Santa Maria, Cal.

Leo Kroonen is opening a fine deposit of flint clay in his Santa Ana Mountain holdings, near Corona, Ca.

The City Council of Los Angeles, Cal., has ordered the City Clerk at that place to re-advertise for bids for 1,000,000 brick for the outfall sewer.

The California State Miners' Association will hold a convention in San Francisco December 5th to the 8th. Papers will be read and one of the chief topics for discussion will be the study of clay deposits now being carried on by the State Mining Bureau.

Mr. Stern, president of the Richmond Brick Company, states that the company contemplates extensive improvements at the plant on the first of the year.

The main office on the Pacific Coast of the American Sand-Lime Brick Company has been removed from the Rialto Building, San Francisco, to Fresno, Cal.

Lew Thorne, the Pacific Coast representative of the J. D. Fate Company, is expected to arrive shortly from his Eastern trip. He is now in Salt Lake City and should be home next week.

Gladding, McBean & Co. report that trade has continued active during the winter months and that next year should be an excellent one for building activity.

Martin & Mack, proprietors of the Eugene Brickyard at Eugene, Ore., intend to install a plant for the purpose of testing the manufacture of fire brick.

H. C. Rohr has been appointed general superintendent of the Monterey Brick Manufacturing Company at Monterey, Mex. The works are running at their full capacity.

Brick moulding was finished last week at the Western Brickyard at Weston, Ore., after a very successful season, signalizing the largest output in the yard's history. Men are still employed in shipping brick, which are going out as rapidly as cars can be obtained to supply an active demand.

Halz & Son have lumber on the ground for the erection of a large dry house at their brickyard at Gainesville, Idaho. The building will be 225x130 feet, and they expect to have it completed this fall. This will enable the firm to make good brick at any time during the year, which has heretofore been a serious drawback. They have also ordered a new press and crusher, and in another year will be able to turn out first-class pressed brick.

The Cheney Brick, Tile and Manufacturing Company, at Cheney, Wash., has decided to purchase the brick plant at Almira. The company has the money to make the first payment, and an assessment will be levied to raise money for moving the plant to the grounds, which will be done immediately so that as soon as the ground is in condition in the spring, brickmaking will commence.

The Wheeland Brick Company, of San Francisco, Cal., commenced making brick with their improved machinery on December 1st. C. J. Titus, president of the Bank of Mountain View, Cal., is acting as president of the Wheeland Brick Company in place of Samuel Wheeland, deceased. William R. Wheeland, brother of the late Samuel Wheeland, and one of his heirs, has filed an opposition to the application of the administratrix for permission to sell the stock of the Wheeland Brick Company at 50 cents a share. He declares that the stock is worth $1, will be paying dividends, and that the company is on a profit-making basis. He says a new dryer has been installed that will give the plant a capacity of 10,000,000 bricks a year, and that a contract has been mde for 4,000,000 bricks for the new library at Stanford University, upon which the profit will be $1.50 per thousand.

The Garden City Pottery Company has been organized at San Jose, Cal., by Alfred S. Rix, Daniel Raymond, Leroy B. Johnson, T. C. Barnett and George C. Anderson. The capital stock is $20,000. The object of the company is to produce and deal in all products manufactured out of clay. Sunset.

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